

## REVISION OF THE TRUXALINÆ OF NORTH AMERICA.

(Read before the Academy, November 29th, 1895.)

BY JEROME MCNEILL.

It is proper to state that this paper is based largely upon the material of the United States National Museum, to whose officers I am much indebted for the generosity with which the collection was placed at my disposal for study during the three months which I was able to spend in Washington. For these and other favors I am deeply indebted to Dr. C. V. Riley and Dr. L. O. Howard. Dr. S. H. Scudder has placed me under great obligations by sending me many of the rare and sometimes unique specimens of his less-known species. I have also received help in the way of types and other specimens, as well as valuable notes, from Prof. R. S. Morse, which I gratefully acknowledge. I am indebted to the kindness of Mr. Coquillett for valuable notes on his very interesting collection of *Orthoptera* made in Southern California and now included in the collection of the National Museum. Finally, I owe to the generosity of Mr. Ashmead the possession of a small but valuable collection of *Orthoptera* from Florida.

My own collection of *Orthoptera* contains all the species of the *Truxalinæ* found west of the Alleghenies, east of the great plains, and north of Texas and Florida and a large portion of the other species of North America outside of Mexico and Central America. I regret extremely that I have not been able to see more of the Mexican species of Saussure and Walker, but the types are not easily accessible and without them the often meagre descriptions are insufficient for the certain determination of their species. With the single exception of *Alpha*, I have not accepted the genera proposed by Brunner in his excellent *Révision du Système des Orthoptères*. The brief descriptions given in his key and the failure to name the species (except in the case noted above) upon which his genera were founded, together with the fact that many Mexican forms were unknown to him, have made it impossible to satisfactorily identify these genera.

The *Truxalinæ* constitute a sub-family of *Acrididæ*. They are more closely related to *Ædipodinæ* than to any other group of equal rank,

and though they present on the whole a very different appearance and, in fact, are different in a large number of characters from *Ædipodinæ*, the connecting links between them are so numerous that it is difficult to find any clearly definable characters which will serve to separate these sub-families.

KEY TO THE AMERICAN SUB-FAMILIES OF ACRIDIDÆ.

- A.<sup>1</sup> Tarsi not furnished with a pulvillus. Pronotum extending to or beyond the end of the abdomen. . . . . 1.—*Tettiginæ*.
- A.<sup>2</sup> Tarsi furnished very generally with a pulvillus. Pronotum much exceeded by the abdomen.
- B.<sup>1</sup> Antennæ shorter than the anterior femora. . . . . 2.—*Proscopinæ*.
- B.<sup>2</sup> Antennæ longer than the anterior femora.
- C.<sup>1</sup> Prosternum unarmed or, if furnished with a more or less distinct tubercle or spine, the lateral carinæ of the pronotum or the lateral foveolæ of the vertex are present and well developed.
- D.<sup>1</sup> Vertex of the head generally horizontal or a little ascending. Viewed from the side, the vertex forms an angle, more or less rounded, with the front, which is very generally moderately or strongly oblique. In no case is the median carina of the pronotum crested or cut by more than one sulcus and the posterior margin of the metazone is never sharply angulate. . . . 3.—*Truxalinæ*.
- D.<sup>2</sup> Vertex of the head very generally declivent. Viewed from the side, the vertex is nearly always roundly and not angulately united with the front, which is sub-perpendicular, rarely decidedly oblique. In the rare cases where the head is truxaline, the pronotum and the tegmina are strongly ædipodine, *i. e.*, the lateral carinæ are obsolete, the median carina is cut by more than one incision or is crested, or the metazone is sharply angulate and the tegminæ are everywhere densely and regularly reticulate. . . . . 4.—*Ædipodinæ*.
- C.<sup>2</sup> Prosternum armed with a tubercle or spine.
- D.<sup>1</sup> Front very oblique. Lateral foveolæ meeting in the median line so as to form the anterior part of the roof of the vertex. . . . . 5.—*Pyrgomorphinæ*.
- D.<sup>2</sup> Front rarely very oblique, frequently sub-perpendicular. Lateral foveolæ, if present, never meeting nor forming a part of the roof of the vertex. . . . . 6.—*Acridinæ*.

The following comparison may help to show that in spite of the difficulty of separating these sub-families there are really very distinct truxaline and œdipodine characters of the head, the pronotum, the tegmina, and the wings. Unfortunately, for classification, a truxaline head does not always go with truxaline pronotum and tegmina. It will usually be found, however, that when one set of characters are strongly presented in one part the opposite set will be no less strongly indicated in the other two regions. Thus, while *Acrotophitus* and *Machaerocera* have truxaline heads, they have the typical œdipodine pronotum, tegmina and wings. I have, accordingly, on account of the preponderance of the last mentioned characters followed Dr. Scudder in excluding these and allied forms from the sub-family under discussion. *Boopedon*, on the other hand, has an œdipodine head, but it too has the characters of the head reversed in the pronotum, tegmina, and wings. There still remain certain genera, as *Psoloessa*, *Stirapleura*, *Aulocara*, and their allies, in which the opposing characters of these two sub-families are so evenly blended that in the end it is a somewhat arbitrary line that divides the *Truxalinæ* from *Ædipodinæ*. I hope, however, that the character I have chosen (the presence of but one transverse incision which cuts the median carina) will not prove altogether unnatural. In accordance with this character I have removed *Psoloessa*, *Stirapleura* and some allied forms, as well as one species of the genus, *Aulocara*, from *Ædipodinæ* and included them in *Truxalinæ*.

CHARACTERS OF THE HEAD.

TRUXALINÆ.

- 1.—Vertex horizontal or ascending and, when seen from the side, this and the face form an angle rather than a regular curve.
- 2.—The front is decidedly oblique.
- 3.—The lateral foveolæ are frequently absent or invisible from above.
- 4.—The antennæ are very frequently depressed, acuminate, triquetrous, or clavate.

ÆDIPODINÆ.

- 1.—Vertex declined and, when seen from the side, united with the face by a curved line.
- 2.—The front is sub-perpendicular.
- 3.—The lateral foveolæ are present and visible from above.
- 4.—The antennæ are very rarely anything but filiform.

CHARACTERS OF THE PRONOTUM.

- 5.—The width of the pronotum is little greater at the posterior than at the anterior end.

- 5.—The width of the pronotum is much greater at the posterior than at the anterior end.

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| <p>6.—The lateral carinæ are distinct.</p> <p>7.—The median carina is always cut by one sulcus, and it is never crested.</p> <p>8.—The prozone is not shorter than the metazone.</p> <p>9.—The posterior angle of the metazone is never sharp or acute angled, generally very obliquely and roundly angulate or straight.</p> <p>10.—The surface is generally smooth, not wrinkled or tuberculose.</p> <p>11.—The lateral lobes are generally plainly narrowed below, the anterior or posterior margin (one or both) being oblique.</p> | <p>6.—The lateral carinæ are obsolete.</p> <p>7.—The median carina is cut by one, two, three, or no sulcus, and it is often crested.</p> <p>8.—The prozone is shorter than the metazone.</p> <p>9.—The posterior angle of the metazone is very frequently sharp or acute angled, never straight.</p> <p>10.—The surface is generally wrinkled or tuberculose.</p> <p>11.—The lateral lobes are generally not narrowed below, but both the anterior and posterior margins are sub-perpendicular.</p> |
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CHARACTERS OF THE TEGMINA AND WINGS.

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| <p>12.—The intercalary vein of the tegmina is generally wanting</p> <p>13.—The scapular area of the tegmina is often expanded, and the venation is scalariform.</p> <p>14.—Imperfect tegmina and wings are very common. Abortive and long-winged forms in the same species are not uncommon.</p> <p>15.—The tegmina are plain or striped. If maculate, the spots are not arranged in bands.</p> <p>16.—The wings are generally transparent, never bright colored, nor with a black band.</p> | <p>12.—The intercalary vein of the tegmina is commonly present.</p> <p>13.—The scapular area of the tegmina is narrow, and the venation irregularly reticulate.</p> <p>14.—Imperfect tegmina and wings are very rare. Abortive and long-winged forms in the same species do not occur.</p> <p>15.—The tegmina are plain or maculate, scarcely ever striped. If maculate, there is a tendency for the spots to be arranged in bands.</p> <p>16.—The wings are generally bright colored, and most generally have a black band.</p> |
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KEY TO TRUXALINÆ.

- A.<sup>1</sup> Head distinctly longer than the pronotum, eyes very oblique, nearly horizontal; metasternal lobes contiguous. (Fig. 2b, 2c.)
- B.<sup>1</sup> Tegmina very much shorter than the abdomen; spines of the posterior tibiæ minute and numerous, about 25 . . . . . 1.—*Radinotatum*, n. gen.
- B.<sup>2</sup> Tegmina exceeding the abdomen; spines of the posterior tibiæ less numerous, about 16 . . . . . 2.—*Achurum*, Sauss.
- A.<sup>2</sup> Head sometimes equaling, never exceeding, the pronotum in length.
- B.<sup>1</sup> Mesosternal lobes separated by a space almost linear in its narrowest part (Fig. 3b); metasternal lobes approximate in both male and female . . . . . 3.—*Mermiria*, Stål.
- B.<sup>2</sup> Mesosternal lobes separated by a space never much longer than broad (Fig. 4b), generally broader than long (Fig. 11b); metasternal lobes rarely approximate in the male, very rarely in the female.
- C.<sup>1</sup> Antennæ triquetrous (Fig. 4a) or strongly depressed at the base and distinctly acuminate (Fig. 5a); pronotum with the lateral lobes vertical and straight and the lateral carinæ not at all sinuate (Fig. 5a); median carina of the pronotum generally cut much behind the middle (Fig. 3a); the disk plain and unstriped.
- D.<sup>1</sup> Spines of the exterior margin of the posterior tibia 15 or more; posterior margin of the disk of the pronotum nearly straight, scarcely angled or rounded . . . . . 4.—*Pseudopomala*, Morse.
- D.<sup>2</sup> Spines on the exterior margin of the posterior tibia less than 15; posterior margin of the disk of the pronotum obtusely angled or rounded.
- E.<sup>1</sup> Tegmina exceeding the abdomen considerably in both sexes (in some large females but little); lateral carinæ of the pronotum quite as distinct as the median; spurs at the apex of the posterior tibiæ on the inner side about equal . . . . . 5.—*Truxalis*, Fabr.

- E.<sup>2</sup> Tegmina not exceeding the abdomen, even in the male.
- F.<sup>1</sup> Lateral foveolæ of the vertex linear and distinct (Fig. 6); tegmina quite unspotted; inner spurs of the posterior tibiæ equal. . . . . 6.—*Napaia*, n. gen.
- F.<sup>2</sup> Lateral foveolæ less distinct and sub-triangular or obsolete; tegmina more or less distinctly spotted as well as the face and pronotum; inner tibial spurs very unequal, the longer but little shorter than the first tarsal joint. . . . . 7.—*Orcina*, n. gen.
- C.<sup>2</sup> Antennæ never triquetrous (Fig. 4a), sometimes plainly depressed basally and acuminate (Fig. 5a), most commonly filiform (Fig. 10a), rarely clavate (Fig. 9a); pronotum with the lateral lobes less distinctly vertical, with the lateral carinæ very rarely quite straight, but gently (Fig. 12a) or strongly (Fig. 10a) sinuate near the middle, median carina of the pronotum generally cut in or not far behind the middle. (Figs. 9a, 10a.)
- D.<sup>1</sup> Tempora either foveolate or plain, not visible from above. (Figs. 7a, 8a, 11a.)
- E.<sup>1</sup> Scutellum of the vertex with a distinct median carina which is usually a coarse raised line stronger anteriorly. (Figs. 7a, 8a, 12a.)
- F.<sup>1</sup> Spurs on the inner side of the posterior tibiæ very unequal, the apical spur being twice as long as the other (Figs. 8 and 9); antennæ very greatly exceeding the head and pronotum.
- G.<sup>1</sup> Antennæ depressed basally and distinctly acuminate. No supplementary carinæ (compare Fig. 9a) present either upon the head or disk of the pronotum . . . . . 8.—*Pedeticum*, n. gen.
- G.<sup>2</sup> Antennæ depressed apically and somewhat clavate. Supplementary carinæ accompanying the median carina upon either the head or the disk of the pronotum. (Fig. 9a). . . . 9.—*Eritettix*, Bruner.
- F.<sup>2</sup> Spines of the inner side of the posterior tibiæ about equal in length. (Fig. 11.)
- G.<sup>1</sup> Spines on the exterior margin of the posterior tibiæ 19–21. . . . . 10.—*Syrbula*, Stål.
- G.<sup>2</sup> Spines of the exterior margin of the posterior tibiæ not exceeding 15.
- H.<sup>1</sup> Median carina of the pronotum cut in the middle by the principal sulcus.
- I.<sup>1</sup> Color striped distinctly or obscurely. Scapular area of the tegmina broader than the mediastine area. (Fig. 11.)
- J.<sup>1</sup> Lateral carinæ of the pronotum obsolete, median carina accompanied by a supplementary pair upon the disk. (Fig. 11a). . . . . 11.—*Amphitornus*, n. gen.

- J.<sup>2</sup> Lateral carinæ of the pronotum present, median carina not accompanied by supplementary carinæ upon the disk. (Fig. 12a) . . . . . 12.—*Akentetus*, n. gen.
- I.<sup>2</sup> Color plain; scapular area of the elytra not broader than the mediastine area. (Fig. 13.) . . . . . 13.—*Amblytropidia*, Stål.
- H.<sup>2</sup> Median carina of the pronotum cut much behind the middle by the principal sulcus. . . . . 14.—*Chlocæltis*, Harr.
- E.<sup>2</sup> Scutellum of the vertex with no distinct median carina. (Fig. 15a.)
- F.<sup>1</sup> Median carina of the pronotum cut much behind the middle by the principal sulcus.
- G.<sup>1</sup> Posterior margin of the metazone angulate. Tegmina usually much shorter than the abdomen, with the ulnar area not very much wider than the discoidal area. (Fig. 22, u.a., d.a.) . . . . . 15.—*Dichromorpha*, Morse.
- G.<sup>2</sup> Posterior margin of the metazone rounded or not distinctly angulate. Tegmina not much shorter than the abdomen, with the ulnar area very wide and several times as broad as the discoidal area. . . . . 16.—*Clinocephalus*, Morse.
- F.<sup>2</sup> Median carina cut near the middle by the principal sulcus.
- G.<sup>1</sup> Hind tibiæ never red. . . . . 17.—*Orphula*, Stål.
- G.<sup>2</sup> Hind tibiæ red.
- H.<sup>1</sup> Antennæ depressed basally, long and acuminate; face strongly oblique. . . . . 18.—*Alpha*, Brunner.
- H.<sup>2</sup> Antennæ filiform, face moderately oblique in the male, subperpendicular in the female. . . . . 19.—*Philibostroma*, Scud.
- D.<sup>2</sup> Tempora plain or foveolate, visible from above (in *Mecostethus* small or minute, triangular, and basal (Fig. 22a). In this case the intercalary vein is very strong (Fig. 22). In *Boötettix*, female, not very easily visible from above as they are almost vertical plain triangular spaces (Figs. 23a and 23b). In this case the antennæ are shorter than the head and pronotum and the lateral carinæ of the pronotum are wanting).
- E.<sup>1</sup> The vertex is not bounded in front by a raised line and, viewed from the side, it does not form an angle with the face. (Figs 20 and 21; compare 22 and 23.) The tempora are very faintly impressed spaces which are very strongly declivent. Intercalary vein of the tegmina wanting. (Figs. 20, 21.)
- F.<sup>1</sup> Tegmina plain; lateral carinæ of the pronotum very little sinuate. . . . . 20.—*Boöpedon*, Thos.

- F.<sup>2</sup> Tegmina distinctly spotted; lateral carinæ of the pronotum strongly sinuate. . . . . 21.—*Plectrophorus*, n. gen.
- E.<sup>2</sup> The vertex bounded in front by a raised line, viewed from the side it forms a more or less distinct angle with the face or it is not at all angulate.
- F.<sup>1</sup> Median carina of the pronotum high and sharp, cut by the principal sulcus in, or plainly in front of, the middle. Intercalary vein very strong. Apical spurs on the inner side of the posterior tibiæ subequal. . . . . 22.—*Mecostethus*, Fieb.
- F.<sup>2</sup> Median carina of the pronotum rarely cut plainly in front of the middle, in this case it is not high and sharp, or the intercalary vein is not strong. (In *Stirapleura* and *Psoloëssa* the intercalary vein is present but not very strong and the inner apical spurs of the posterior tibiæ are very unequal).
- G.<sup>1</sup> Lateral carinæ of the pronotum entirely obsolete even on the metazone and the anterior of the prozone. Scapular area of the tegmina of the male forming a conspicuous musical organ.
- H.<sup>1</sup> Vertex of the head forming an acute angle with the face; tempora nearly plain triangular spaces. . . . . 23.—*Boötettix*, Bruner.
- H.<sup>2</sup> Vertex of the head forming an obtuse angle with the face. Tempora impressed, trapezoidal. . . . . 24.—*Ligurotettix*, n. gen.
- G.<sup>2</sup> Lateral carinæ of the pronotum usually distinct, present at least upon the metazone and the anterior part of the prozone.
- H.<sup>1</sup> Tempora elongate, narrow, from two to four times as long as broad. The apical spur on the inner side of the posterior tibiæ is much less than twice as long as the one beside it.
- I.<sup>1</sup> Antennæ filiform.
- J.<sup>1</sup> Median carina of the pronotum cut in the middle. Posterior margin of the pronotum plainly more angulate than the anterior. . . . . 25.—*Stenobothrus*, Fisch.
- J.<sup>2</sup> Median carina of the pronotum cut plainly behind the middle. Posterior margin of the pronotum not more angulate than the anterior. . . . . 26.—*Brunneria*, n. gen.
- I.<sup>2</sup> Antennæ clavate. . . . . 27.—*Gomphocerus*, Thunb.
- H.<sup>2</sup> Tempora short, little more than once as long as broad or, when twice as long, the apical spur on the inner side of the posterior tibiæ is twice as long as the one beside it.
- I.<sup>1</sup> Posterior margin of the metazone straight or just perceptibly angulate. Pronotum shorter than the head, which is very large. . . . . 28.—*Pnigodes*, n. gen.

- I.<sup>2</sup> Posterior margin of the metazone distinctly or strongly angulate. Pronotum never shorter than the head, generally plainly longer (viewed from above).
- J.<sup>1</sup> Median carina of the pronotum cut behind the middle of the pronotum. Vertex of the head destitute of a median carina. Posterior margin of the metazone very obtusely angulate. . . . . 29.—*Ercmnus*, n. gen.
- J.<sup>2</sup> Median carina of the pronotum cut more or less plainly in front of the middle, never behind. Summit of the head furnished with a more or less distinct median carina which sometimes extends nearly or quite to the tip of the vertex and is most distinct on the posterior part of the scutellum. Posterior margin of the metazone strongly angulate.
- K.<sup>1</sup> Lateral lobes of the pronotum furnished with a single or double series of short irregular and sometimes indistinct carinæ which extend from about the middle of the anterior margin toward or to the upper posterior angle; also with a second more distinct, low, broad, light-colored carina which extends from the middle of each lobe toward the lower posterior angle. Sometimes this carina is distinct only at the anterior end. Face nearly perpendicular, rarely very moderately inclined. Frontal costa sulcate throughout, acuminate at the vertex and regularly divergent below. . . . . 30.—*Stirapleura*, Scud.
- K.<sup>2</sup> Lateral lobes of the pronotum destitute of carinæ. Face distinctly and considerably oblique. Frontal costa not sharply acuminate above and scarcely sulcate at any point. . . . 31.—*Psoloëssa*, Scud.

I. **RADINOTATUM**,\* n. gen. Fig. 1.

Sexes very unequal in size. Body very slender and considerably compressed. Head plainly longer than the pronotum, elongate pyramidal with the occiput and vertex in the same plane, ascending, the face extremely inclined and, viewed from the side, decidedly sinuate. The vertex in front of the eyes is about as long as the eyes, somewhat longer than broad with the lateral margins parallel, and suddenly and roundly acuminate in front where they form an angle a little greater than 90 degrees. The margins of the vertex are not raised, but are extended horizontally into lamellæ which are wider anteriorly where they equal the lesser diameter of the eye. The scutellum of the ver-

\**Ραδινότατον*, a very slender thing.

tex is concave with a median carina which continues to the end of the body. The tempora are entirely wanting. The frontal costa is a high, narrow ridge just below the vertex, very quickly expanding to form a very narrow deeply sulcate costa with the walls elevated and nearly parallel except on the lower part of the face where they expand slightly. The antennæ are short, triquetrous, placed higher than the eyes. The eyes are elongate ovate and are placed nearly horizontally. The ocelli are above the eyes instead of in front of them. The pronotum has all of the carinæ distinct and parallel, the median only being cut by the principal transverse incision about one-fourth the distance from the posterior border which is straight. The lateral lobes are vertical, with the lower border straight, the lower angles sharp, the anterior obtuse, the posterior acute, the anterior border very oblique and straight and the posterior border with a reëntral angle. Mesosternal lobes approximate, at least behind, in both male and female, metasternal lobes approximate behind in the female, approximate throughout in the male. Tegmina very rudimentary. Supra-anal plate of the male very long and acute, much exceeding the last ventral segment. Posterior femora very slender, scarcely compressed, with the apical angles produced. Spines of the posterior tibia minute and very numerous. Inner apical spur of the posterior tibiæ much longer than the outer.

This genus is based upon the single species formerly known as *Achurum brevipenne*, Thos. The genus *Achurum* was founded upon the species *A. sumichrasti*, Sauss., and made by Stål to include the closely allied species *A. acridodes*, Stål, but these species are so radically different from *R. brevipenne*, Thos., in the structure of the posterior femora, and in the last ventral segment of the male, as well as in the tegmina, in the absence of the lateral foveolæ, and in other particulars, that it makes the erection of a new genus advisable.

In part, *Truxalis (Achurum)* Sauss., 1861. Orth. Nov. Am. Ser. II, 15.

In part, *Achurum*, Stål, 1873. Recen. Orth. I, 89.

In part, *Achurum*, Brunner, 1893. Rev. Sys. Orth. 118.

R. BREVIPENNE, Thos. Fig. 1a, 1b.

Length (male).....	31	mm.	(female).....	43	mm.
Tegmina “ .....	4.5	mm.	“ .....	5	mm.
Antennæ “ .....	9	mm.	“ .....	6.5	mm.
Post. Fem. “ .....	14	mm.	“ .....	19	mm.

The median carina of the head is faint upon the posterior part of the occiput. The transverse sulci of the pronotum are obsolete except the principal one, which is barely visible as cutting the median carina. The lateral carinæ are not cut by any incision. The tegmina are about as long as the pronotum, very narrow, bluntly pointed and separated by a space nearly twice as great as their width. The posterior femora are very much (male) or decidedly (female) shorter than abdomen, very little expanded at the base. The spines of the posterior tibiæ are minute and very numerous, being about 25 on the outside. The supra-anal plate of the male is five times as long as the last abdominal segment and projects far beyond the abdomen.

*Truxalis brevipennis*, Thos., 1873. Syn. Acrid. N. Am., 58, pl. fig. 12.

*Achurum brevipennis*, Scud., 1877. Ent. Notes, VI, 29.

**Hab.** This species has been reported only from Florida, where it is probably not uncommon in suitable situations. According to Scudder it is common about Fort Reed, Fla. I have specimens from Orange, Fla., and the National Museum contains a female, which seems to be Thomas' type, and a single male without a label.

## II. ACHURUM, Sauss. Fig. 2.

Sexes not very unequal in size, very slender, with the head longer than the pronotum and the face approaching horizontal. The vertex is much longer than wide with the sides parallel and the front rounded, extending in front of the eyes a distance equal to their length. It is convex with a plain median carina. At the sides it is somewhat lamellate and horizontally extended. The frontal costa is a high, narrow ridge just below the vertex. A short distance below, it becomes sulcate and the sides are slightly divergent to the ocellus, below which they diverge with increasing rapidity and reach the clypeus. The face, seen from the side, is distinctly sinuate. The lateral foveolæ are distinctly linear and are separated from the face by a delicate carina. The eyes are long, elliptical, nearly horizontal and near the middle of the head. The antennæ are much flattened, triquetrous, regularly acuminate, and shorter than the head and pronotum. The pronotum is plain above with the three carinæ distinct and parallel; they are cut by the principal sulcus much behind the middle. The posterior margin of the metazone is roundly angulate. The lateral lobes of the pronotum are vertical and distinctly higher behind with the anterior and posterior borders much inclined, the latter sinuate and the lower

straight and in the same straight line with the lower margin of the cheeks. The prosternum has a very low pyramidal spine. The mesosternal lobes are separated by a space longer than broad in both sexes, and the metasternal lobes are contiguous behind. The tegmina and wings are very long and narrow; they exceed the abdomen much or little in length. The tegmina have the anal field forming a distinct angle with the discoidal field and they are acutely pointed. The ovipositor is small and moderately exerted. The posterior femora are unusually compressed and moderately wide on the basal portion. Their apical angles are produced into two blunt spines.

The posterior tibiæ are furnished on the outside with about 17 moderate spines and they have the apical spurs on the outside not very unequal to those on the inside. The supra-anal plate of the male is much shorter than the last ventral segment, which is acutely tapering and sharpest at the apex.

*Achurum*, Sauss., 1861. Orth. Nov. Am. II, 15.

*Achurum*, Stål., 1873. Recen. Orth., I, 89.

*Achurum*, Brunner, 1893. Rev. Sys. Orth., 118.

This is a North American genus represented by only two species.

#### KEY TO ACHURUM, SAUSS.

- A.<sup>1</sup> Tegmina much exceeding the abdomen; pronotum alutaceo-rugose.....1.—*Sumichrasti*, Sauss.  
 A.<sup>2</sup> Tegmina not exceeding the abdomen; pronotum not alutaceo-rugose, vertex of the head, disk of the pronotum, and anal area of the tegmina green.....2.—*Acridodes*, Stål.

1. ACHURUM SUMICHRASTI, SAUSS. Fig. 2a, 2b, 2c.

*Truxalis (Achurum) sumichrasti*, Sauss., 1861. Orth. Nov. Am., II, 15.

*Truxalis (Achurum) sumichrasti*, Thos., 1873. Syn. Acrid. N. Am., 195.

*Achurum sumichrasti*, Walk., 1870. Cat. Derm. Salt., III, 518.

*Achurum sumichrasti*, Stål., 1873. Recen. Orth., I, 101.

**Hab.** This species is said by Saussure to belong to the temperate regions of Mexico. The National Museum contains specimens from Fort Grant, Arizona.

2. ACHURUM ACRIDODES, STÅL.

*Truxalis acridodes*, Stål., 1873. Ofv. Vet. Akad. Förh., 30:4, p. 52.



*Achurum acridodes*, Stål, 1873. Recen. Orth., I, 101.

*Achurum acridodes*, Thos., 1875. Rept. Geol. and Geog. Surv. W. 100 M., V, Zool., 865.

**Hab.** Mexico. It is doubtful whether this species is distinct from *A. sumichrasti*. I have not seen it.

### III. MERMIRIA, Stål. Fig. 3.

The head is long, sometimes equaling the pronotum, with the top slightly ascending, transversely moderately convex. Vertex horizontal, triangular or semi-elliptical, convex but more or less sulcate near the lateral carinæ, which are more or less distinct, never sharp and high, and which meet at an acute angle or are shortly or broadly rounded at the apex. The median carina of the vertex is either slight, but moderately distinct, or obsolete or entirely wanting. The lateral foveolæ are usually indistinct elongate triangular or sub-lunar spaces without distinct walls. The frontal costa is more or less completely sulcate (frequently very deeply sulcate between the antennæ) and strongly prominent, with the sides acuminate above and sub-parallel below, sometimes suddenly expanding and vanishing near the clypeus. The face, seen from the side, is straight or moderately or strongly sinuate and strongly (female) or very strongly (male) declivent. The antennæ are strongly triquetrous and acuminate and equaling (female) or exceeding considerably (male) the head and pronotum in length. The eyes are long ovate or elliptical and are placed very obliquely. The pronotum is long with the disk a little elevated toward the median carina which is distinct and cut once, more or less plainly, much behind the middle. The lateral carinæ are rarely distinct, usually indistinct or wanting, almost straight and parallel or very slightly divergent on the metazone. The latter has the posterior margin nearly straight or very obtusely angulate or gently rounded. The lateral lobes of the pronotum are vertical and parallel with both the anterior and posterior margins strongly oblique (the latter a little sinuate) and the lower margin straight and in the same line with the lower border of the cheeks. The prosternum has a low quadrate bent spine. The mesosternal lobes are separated by a space longer than broad (female) or are closed (male); the metasternal lobes are closed entirely (male) or behind (female). The tegmina and wings are well developed, usually equaling or exceeding the abdomen. The former have the scapular area a little widened and transparent and somewhat regularly scalariform. The

ovipositor is very short and small, scarcely exerted. Last ventral segment usually elongate and pointed, supra-anal plate acutely tapering. Posterior femora elongate and narrow. Posterior tibiæ with about 19 spines on the outer side. A distinctly post-ocular stripe of ferruginous or brown is usually present on the sides of the head and the lateral lobes of the pronotum and in the male, at least, a longitudinal median stripe of the same color extends from the vertex to the posterior edge of the pronotum.

*Mermiria*, Stål, 1873. Recen. Orth., I, 90.

*Mermiria*, Thos., 1875. Rept. Geol. and Geog. Surv. W. 100 Mer., V, Zool., 866.

*Mermiria*, Brunner, 1893. Rev. Sys. Orth., 119.

In part, *Opsomala*, Serv., 1838. Hist. Nat. Orth., 586.

In part, *Opsomala*, Burm., 1838. Handb. Ent., II, 610.

In part, *Opomala*, Thos., 1873. Syn. Acrid. N. Am., 62.

*Xiphicera*, Perty. Ins. Am. Mer.

This genus is represented by six closely allied species in North America. All the species known are natives of the Southern and Southwestern States though the extreme limits of the range of some of them extends as far north as Nebraska and Illinois.

#### KEY TO MERMIRIA, Stål.

- A.<sup>1</sup> Face, seen from the side, straight, head distinctly shorter than the pronotum.
- B.<sup>1</sup> Posterior femora not exceeding the tegmina, which are unspotted. Vertex rather shortly than broadly rounded in front.
- C.<sup>1</sup> Vertex with some trace of a median carina. Posterior femora very long and slender, exceeding the abdomen in both sexes. Last ventral segment of male elongate, acutely tapering to a point. . . . . 1.—*Bivittata*, Serv.
- C.<sup>2</sup> Vertex entirely destitute of a median carina. Posterior femora comparatively short and heavy, not quite reaching the end of the abdomen in the female. Last ventral segment short and not acutely tapering to a point. . . . . 2.—*Texana*, Bruner.
- B.<sup>2</sup> Posterior femora exceeding the tegmina in both sexes. Tegmina generally spotted. Vertex broadly rounded. . . . . 3.—*Maculpennis*, Bruner.
- A.<sup>2</sup> Face seen from the side plainly sinuate. Vertex as long as or longer than broad. Head as long as the pronotum.

- B.<sup>1</sup> Vertex semi-elliptical rather than triangular with a faint median carina. Lateral carinæ of the pronotum present and moderately distinct. Posterior margin of the metazone hardly perceptibly rounded. . . . . 4.—*Ncomexicana*, Thos.
- B.<sup>2</sup> Vertex triangular rather than semi-elliptical. Lateral carinæ of the pronotum scarcely apparent. Posterior margin of the metazone plainly though very obtusely angulate or rounded.
- C.<sup>1</sup> Vertex sub-triangular with the sides generally arcuate and the tip rounded, the median carina not entirely obsolete. The top of the head green with a ferruginous median stripe (at least in the male). Face green with a ferruginous stripe at each side. Median carina of the pronotum distinct, the sulci faint but visible. . . . . 5.—*Alacris*, Scud.
- C.<sup>2</sup> Vertex acutely triangular with the sides straight and the tip hardly blunt even in the female, the median carina entirely wanting. The top\* of the head with a very broad fuscous stripe (at least in the male) which is separated from the post ocular stripe by a green stripe no wider than the latter. Face purplish. Median carina of the pronotum less distinct. Sulci obsolete. . . . 6.—*Rostrata* n. sp.

I. MERMIRIA BIVITTATA, Serv.

*Opsomala bivittata*, Serv., 1839. Hist. Nat. Ins. Orth., 589.

*Opsomala bivittata*, Walk., 1870. Cat. Derm. Salt., III, 507.

*Opomala bivittata*, Thos., 1865. Trans. Ill. State Agr. Soc., V, 447.

*Opomala bivittata*, Thos., 1872. Prelim. Rept. U. S. Geol. Surv. Mont., 429.

*Opomala bivittata*, Thos., 1872. Prelim. Rept. U. S. Geol. Surv. Mont., 432.

*Opomala bivittata*, Scud., 1872. Final Rept. U.S. Geol. Surv. Neb., 250.

*Opomala bivittata*, Thos., 1873. Syn. Acrid. N. Am., 65, fig. 16.

*Acridium bivittata*, Bruner, 1877. Can. Ent., IX, 144.

*Acridium bivittatum*, de Haan, 1842. Bijdr. Kenn. Orth., 143.

*Mermiria bivittata*, Scud., 1877. Cent. Orth., 47.

*Mermiria bivittata*, Bruner, 1883. 3d Rept. U. S. Ent. Com., 55.

*Mermiria bivittata*, Bruner, 1885. Bul. Wash. Col. Lab. Nat. Hist., I, no. 4, 130.

*Mermiria bivittata*, Osborn, 1892. Proc. Iowa Acad. Sci., 1890-91, 4.

*Mermiria bivittata*, Townsend, 1893. Ins. Life, VI, 31.

**Hab.** United States east of the Rocky Mountains, extending as far north as Nebraska, Illinois, and Virginia.

This is the most widely distributed species of the genus.

2. MERMIRIA TEXANA, Bruner.

*Mermiria texana*, Bruner, 1889. Proc. U. S. Nat. Mus., XII, 53, pl. i, fig. 2.

**Hab.** Lerodo, Durango, Mex.; El Paso, Tex. (Bruner); Colorado Springs, Col.; Ft. Grant, Arizona. It is said by Bruner to be "met with only among the sisal producing plants growing upon the rocky hills back from the rivers."

3. MERMIRIA MACULIPENNIS, Bruner.

*Mermiria maculipennis*, Bruner, 1889. Proc. U. S. Nat. Mus., XII, 54.

**Hab.** San Antonio, Carrizo Springs, Texas. (Bruner.)

The National Museum contains one of Bruner's types from Carrizo Springs and several other specimens from the same State, and in addition a male and female from Risville, Nevada, and a female from Kansas which have the tegmina unspotted, but in other respects seem to be very much like this species. It is possible that the species is not distinct from *M. bivittata*.

4. MERMIRIA NEOMEXICANA, Thos.

*Opomala neomexicana*, Thos., 1870. Proc. Acad. Nat. Sci. Phil., 77.

*Opomala neomexicana*, Thos., 1871. Prelim. Rept. U. S. Geol. Sur. Wyo., 269.

*Opomala neomexicana*, Thos., 1872. Prelim. Rept. U. S. Geol. Sur. Mont., 429 and 432.

*Opomala neomexicana*, Thos., 1873. Syn. Acrid. N. A., 65.

*Opomala neomexicana*, Bruner, 1877. Can. Ent., IX, 144.

*Mermiria neomexicana*, Scud., 1876. Bul. U. S. Geol. and Geog. Sur., II, 262.

*Mermiria neomexicana*, Scud., 1877. Cent. Orth., 47.

*Mermiria neomexicana*, Bruner, 1883. 3d Rept. U. S. Ent. Com., 55.

*Mermiria neomexicana*, Bruner, 1885. Rept. Com. Agr., 307.

*Mermiria neomexicana*, Bruner, 1885. Bul. Wash. Col. Lab. Nat. Hist., I, no. 4, 130.

*Mermiria neomexicana*, Bruner, 1886. Bul. Wash. Col. Lab. Nat. Hist., I, No. 7, 196.

*Mermiria belfragei*, Stål, 1873. Recen. Orth., I, 102.

*Mermiria belfragei*, Thos., 1875. Rept. Geog. and Geol. Surv. W. 100 M., V. Zool., 856 and 901.

*Mermiria belfragei*, Scud., 1877. Cent. Orth., 47.

**Hab.** The eastern slopes of the Rocky Mountains from Wyoming to New Mexico and eastward to Georgia.

The National Museum contains a specimen which seems to be the type. Except *M. bivittata* it is the most widely distributed species of the genus. It seems to be partial to regions where vegetation is sparse.

5. MERMIRIA ALACRIS, Scud. Fig. 3a, 3b.

*Mermiria alacris*, Scud., 1877. Cent. Orth., 47.

*Mermiria alacris*, Bruner, 1883. 3d Rept. U. S. Ent. Com., 55.

**Hab.** Georgia (Scudder), Dallas, Tex.

The National Museum contains a male and female from the last mentioned locality.

6. MERMIRIA ROSTRATA, n. sp. Fig. 3c.

Length (male).....	36 mm	(female).....	46 mm.
Antennæ.....	16 mm		
Tegmina.....	24 mm.....		33.5 mm.
Post. Fem.....	18 mm		

Vertex triangular, as long as (female) or longer than (male) wide with the sides straight and meeting at a very acute angle which is barely blunt at the tip. The median carina of the vertex is entirely wanting and the sides are somewhat expanded and a little ascending. The frontal costa is deeply sulcate throughout in the male and in the female above the ocellus; below it ends suddenly half-way between the ocellus and the clypeus. The face is very decidedly sinuate. The lateral foveolæ are quite distinct, elongate triangular and curved. The pronotum is scarcely (female) or not longer than the head. The median carina is less distinct than in *alacris* and the lateral carinæ are very faint. The transverse sulci are scarcely distinguishable and the metazone is scarcely perceptibly punctate. The lower margin of the lateral lobes of the pronotum is straight or perceptibly sinuate. The usual postocular band has at its lower border a very faint carina (in this respect it resembles *alacris* and *bivittata*). The colors are green and ferruginous or purplish-brown, the dark color being more decided in the male. In this sex the face is completely infuscated and the top of the head is occupied by a very broad band which is three times as

broad as the green stripe on either side. The lower half (female) or third (male) of the tegmina is green, the rest ferruginous. The last ventral segment is decidedly elongate as in *alacris*. The posterior femora do not exceed the abdomen.

Described from two males and one female from Mackay, I. T., where the species is said by the collector, Prof. S. E. Meek, to be common on the small prairies which are interspersed through the forests of that region.

This species is more closely related to *alacris* than to any other of the *Mermiria*, but it is readily distinguished by the very different vertex.

#### IV. PSEUDOPOMALA, Morse. Fig. 4.

Vertex horizontal, longer than broad, semi-elliptical, medianly convex with a very distinct carina, laterally sulcate (female) or extended into lamina (male), with the margins limited by lateral carinae. The lateral foveolae are wanting. The frontal costa is sulcate throughout with slightly divergent heavy lateral carinae except at the immediate apex where it is much constricted. The face is very declivent and straight or a very little sinuate on account of the prominence of the frontal costa between the antennae. These are very slightly triquetrous and very much flattened and expanding basally, equaling the short diameter of the eye nearly (male) or quite (female) and strongly acuminate. They equal the head and pronotum in length (female) or greatly exceed them (male). The pronotum is but little longer than the head. Its disk is nearly plain, slightly elevated toward the median carina which is distinct and cut only once much behind the middle by the principal sulcus which alone is apparent upon the disk. The lateral carinae are distinct, parallel, cut by the principal sulcus only. The posterior margin of the metazone is straight. The lateral lobes of the pronotum are vertical, slightly convex above, with the anterior and posterior margins strongly oblique, the one straight, the other sinuate just above the posterior lower angle, which is sharp and sub rectangular. The lower margin is nearly straight and horizontal. The mesosternal lobes are separated by a space longer than broad (female) or by a linear ridge with a deep pit on either side (male). The wings in both sexes and the tegmina (female) are abortive or they are well developed. In the male the scapular area is enlarged with prominent cross veins. The posterior femora are slender, not banded. The posterior tibiae has the apical spurs on the inner side not very unequal.

The last ventral segment of the male is horizontal, elongate, conical and four times as long as the penultimate segment. The valves of the ovipositor are exerted, the lower ones furnished with a strong lateral tooth, the upper ones with two distinct basal teeth.

This genus is North American and is represented by two species.

*Pseudomopala*, Morse, 1896. *Psyche*, VII, 325 and 342, fig. 6, 6a, 6b.

*Opomala*, Scud., 1862. *Journ. Bost. Soc. Nat. Hist.*, VII, 454.

In part, *Opomala*, Thos., 1873. *Syn. Acrid. N. Am.*, 62.

KEY TO PSEUDOPOMALA, Morse.

- A.<sup>1</sup> Wings wanting. . . . . 1.—*Aptera*, Scud.  
 A.<sup>2</sup> Wings present, usually small. . . . . 2.—*Brachyptera*, Scud.

1. PSEUDOPOMALA APTERA, Scud.

*Opomala aptera*, Scud., 1869. *Proc. Am. Ent. Soc.*, II, 305.

*Opomala aptera*, Walk., 1870. *Cat. Derm. Salt.*, V, 52.

*Opomala aptera*, Thos., 1873. *Syn. Acrid. N. Am.*, 63.

*Opomala aptera*, Bruner, 1877. *Can. Ent.*, IX, 144.

*Opomala aptera*, Bruner, 1883. *3d Rept. U. S. Ent. Com.*, 55.

**Hab.** Pennsylvania. It is very doubtful whether this species is distinct from *P. brachyptera*. Bruner apparently recognized it in Nebraska (in *Can. Ent.*, IX, 144), but later he refers it to Pennsylvania alone, which was Scudder's original reference. It has never been reported there since its first mention and it is not found in any (not even Scudder's) collection with which I am acquainted. It seems altogether probable, therefore, that it is merely an apterous form of *brachyptera*. I think it best, however, not to place it in the list of synonyms until further collections are made in the place where it was found and its identity is thoroughly established.

2. PSEUDOPOMALA BRACHYPTERA, Scud. Fig. 4a, 4b.

*Opomala brachyptera*, Scud., 1862. *Journ. Bost. Soc. Nat. Hist.*, VII, 454.

*Opomala brachyptera*, Thos., 1871. *Proc. Acad. Nat. Sci. Phila.*, 151.

*Opomala brachyptera*, Thos., 1872. *Prelim. Rept. U. S. Geol. Surv. Mont.*, 429, 432, 446.

*Opomala brachyptera*, Thos., 1873. *Syn. Acrid. N. Am.*, 63.

*Opomala brachyptera*, Bruner, 1877. *Can. Ent.*, IX, 144.

*Opomala brachyptera*, Bruner, 1883. *3d Rept. U. S. Ent. Com.*, 55.

*Opomala brachyptera*, Fernald, 1887. *Orth. N. E.*, 35.

*Opomala brachyptera*, Bruner, 1885. Rept. Com. Agr., 307.

*Opomala brachyptera*, Morse, 1894. Psyche, VII, 13 and 106.

*Opomalo brachyptera*, Beutenmüller, 1894. Desc. Cat. Orth., 291.

*Opsomala brachyptera*, Walk., 1870. Cat. Derm. Salt., III, 507.

*Pseudopomala brachyptera*. Morse, 1896. Psyche, VII, 325 and 343, fig. 6, 6a, 6b.

*Mermiria brachyptera*, Osborn, 1892. Proc. Iowa Acad. Sci., 1890-1891, 4.

**Hab.** Northern United States east of the Sierra Nevada Mountains. This species has an extended range east and west, though its distribution throughout the territory it inhabits is comparatively irregular. There is a gap in this range extending from Illinois to New York and Pennsylvania (unless *P. aptera* is a synonym), but since it is found in New England and from Iowa to Utah there is little doubt but that its non-occurrence in the intermediate area is due to the fact of its extreme rarity.

#### V. TRUXALIS, Fabr.

Vertex horizontal, semi-elliptical, length in front of the eyes a little less (female) or a little more (male) than the distance between the eyes. Furnished with a delicate median carina. Lateral carinæ distinct though slight with shallow sulci behind them. Lateral foveolæ entirely wanting. Frontal costa narrow, deeply (male) or shallowly (female) sulcate except just below the vertex where it is suddenly contracted into a mere ridge. The face, seen from the side, is strongly oblique and straight. The antennæ are flattened strongly (female) or moderately (male) at the base and acuminate, about as long as (female) or a little longer than (male) the head and pronotum. The pronotum has the disk plain with the three carinæ parallel, about equally distinct, the median cut by the last sulcus only, the lateral by all the transverse incisions. The metazone is a little shorter than the prozone with its posterior border very obtusely angled. The lateral lobes of the pronotum are perpendicular and parallel, a little longer than high, with both the anterior and posterior margins decidedly oblique, the former straight, the latter sinuate with the lower border straight posteriorly and slightly oblique anteriorly. The lobes of the mesosternum are separated by a space broader than long (female) about as broad as long (male). The lobes of the metasternum are separated by a space about as broad as long (female) or they are contiguous (male). The tegmina are much longer than the abdomen, with the discoidal area



with no intercalary vein. The posterior femora are slender with the apex reaching (female) or exceeding by half their length (male) the abdomen. The valves of the ovipositor of the female are strongly exerted.

In part, *Gryllus (Acrida)*, Linn.

In part, *Truxalis*, Fabr., 1875. Sys. Ent., 279.

In part, *Truxalis*, Burm., 1838. Handb. 606, Orth.

*Truxalis*, Stål, 1873. Recen. Orth., I, 92.

*Truxalis*, Morse, 1896. Psyche, VII, 325, fig. a, aa, ab.

*Metaleptea*, Brunner, 1893. Rev. Sys. Orth., 118.

Not *Truxallis*, Serv., 1839. Hist. Nat. Orth., 578.

Not *Truxalis*, Brunner, 1883. Proc. Eur. Orth., 87.

Not *Truxalis*, Brunner, 1893. Rev. Sys. Orth., 118.

In 1873 Stål, in Rec. Orth., I, saw fit to restore *Acrida*, Linn., restricting it to Linnean species, *Grillus (Acrida) nasuta* and *Acrida serrata*, Thunb. Both of these species had been included in *Truxalis*, Fabr., for more than one hundred years. The latter genus he restricted to the Linnean species *Grillus (Acrida) brevicornis* and other American species which have since been removed to other genera. There is no doubt but that Stål had a right to restore the name *Acrida*. Brunner refused to follow him in the restoration of *Acrida* and the restriction of *Truxalis*, but himself restored *Truxalis* in the Fabrician sense and then suggested the name *Metaleptea* for the American genus. For the present, *Truxalis*, Stål, must stand and *Metaleptea* will remain a synonym unless *Truxalis* is restricted to some of the old world species included in the genus by Fabricius; under which circumstances, as *T. brevicornis* is the only species left to which it could apply, *Metaleptea* would have to be restored.

#### 1. TRUXALIS BREVICORNIS, Linn., 5a, 5b.

*Gryllus (Acrida) brevicornis*, Linn., 1758. Sys. Nat. Orth., I.

*Gryllus (Acrida) brevicornis*, Linn., 1763. Cent. Ins. Rar., 15.

*Gryllus (Acrida) brevicornis*, Linn., 1763. Amoen. Acad., VI, 398.

*Truxalis brevicornis*, Fabr., 1775. Ent. Sys., II, 27.

*Truxalis brevicornis*, Thunb., 1815. Mem. Acad. St. Peter., V, 264.

*Truxalis brevicornis*, Thunb., 1827. Nov. Act. Upsal., IX, 84.

*Truxalis brevicornis*, Stål, 1873. Recen. Orth., I, 104.

*Truxalis brevicornis*, Thos., 1876. Bul. I, Ill. Mus. Nat. Hist., 61.

*Truxalis brevicornis*, McNeill, 1891. Psyche, VI, 66.

*Truxalis brevicornis*, Blatchley, 1891. Can. Ent., XXIII, 75.

*Truxalis brevicornis*, Garman, 1894. 6th Ann. Rept. Ky. Agr. Ex. Sta., 8.

*Truxalis brevicornis*, Blatchley, 1894. Can. Ent., XXVI, 221.

*Truxalis brevicornis*, Beutenmüller, 1894. Desc. Cat. Orth., 29, pl. viii, fig. 7.

*Acridium cnsicormum*, De Geer, 1773. Mem. Ins., 449, pl. xlii, fig. 1, 2.

? *Truxalis notochlorus*, Pal. de Beauv., 1805. Ins. Afr. Amer., 80, pl. iii, fig. 3.

? *Truxalis viridulus*, Pal de Beauv., 1805. Ins. Afr. Amer., 81, pl. iii, fig. 4.

*Tryxalis brevicornis*, Burm., 1838. Handb. Ent., II, 607.

*Tryxalis brevicornis*, Morse, 1896. Psyche, VII, 325, fig. A, Aa, Ab.

*Pyrgomorpha brevicornis*, Thos., 1873. Syn. Acrid. N. Am., 67.

*Pyrgomorpha brevicornis*, Thos., 1874. Bul. 2, U. S. Geol. and Geog. Surv. 64

*Pyrgomorpha brevicornis*, Bruner, 1883. 3rd Rept U. S. Ent. Com., 55.

*Pyrgomorpha punctipennis* Thos., 1873. Syn. Acrid. N. Am., 68.

*Pyrgomorpha punctipennis*, Bruner, 1883. 3rd Rept. U. S. Ent. Com., 55.

*Pyrgomorpha punctipennis*, Schufeldt, 1884. Proc. U. S. Nat. Mus., VII, 332.

*Opsomala punctipennis*, Serv., 1838. Hist. Nat. Ins. Orth., 590.

*Opsomala punctipennis*, Thos., 1865. Trans. Ill. State. Agr. Soc., 447.

*Opsomala punctipennis*, Walk., 1870. Cat. Derm. Salt., III, 507.

*Opomala punctipennis*, Thos., 1873. Syn. Acrid. N. Am., 197.

**Hab.** Eastern and Southern United States. Reported by Stål from Rio Janeiro, Brazil. By Walker, from Honduras. *T. notochlorus* and *viridulus* are reported by Pal. de Beauv. from St. Domingo.

## VI. NAPAIA, n. gen. Fig. 6.

Vertex horizontal, equilaterally triangular, moderately sulcate, with distinct linear median and lateral carinæ. The lateral foveolæ are plainly visible from above, long rhomboidal. The frontal costa is prominent a little above the antennæ, not constricted just below the apex, slightly sulcate below the ocellus and moderately expanding below. The face seen from the side is strongly (female) or very (male) declivent. The antennæ are strongly depressed at the base and acu-

minate, a little longer than the head and pronotum (female) or as long as the hind femora (male). The pronotum has the disk plain, furnished with three carinæ, the median being a little more distinct, the lateral being very slightly sinuate, and all three are cut much behind the middle. The posterior margin of the metazone is very slightly angulate. The lateral lobes of the pronotum are nearly perpendicular, a little convex on the upper part with the anterior and the posterior margins straight and strongly oblique and with the lower margin posteriorly a little descending, anteriorly slightly ascending. The prosternum is armed with a low (female) or high (male) tubercle. The mesosternal lobes are separated by a space a little (female) or not (male) broader than long. The metasternal lobes are very nearly approximate behind. The tegmina are much (female) or a little (male) shorter than the abdomen, the scapular area is expanded and occupied by weak cross veins in the male, the discoidal area is narrow without an intercalary vein and is filled with a single series of cross veins. The posterior femora are moderately slender, extending beyond the abdomen. The posterior tibiæ have about 13 spines on the outer margin. The valves of the ovipositor are very moderately exerted.

This genus contains, so far as known, but a single species. It is most closely related to *Mermiria*, but is easily distinguished from that genus by the distinct lateral foveolæ visible from above, the different structure of the frontal costa just below the vertex, the abbreviated tegmina, and the fewer spines of the posterior tibiæ.

NAPAIA GRACILIS, n. sp. Fig. 6a, 6b, 6c, 6d.

Yellow or brown with a fuscous stripe extending backwards from the eyes limited above by the lateral carinæ of the pronotum, either covering the whole of the sides including the cheeks, lateral lobes of the pronotum, the lower edge of the tegmina, the sides of the abdomen, and the outer face of the posterior femora (male) or it is more or less restricted below, but it is always present. The upper surface of the body and head is distinctly lighter than the sides, plain, or sometimes with two faint curved stripes extending on the top of the head from the corners of the vertex to the lateral carinæ of the pronotum. The tegmina are plain except for the more or less infuscated lower edge. In the male they are four-fifths as long as the abdomen, broadly rounded at the tip. In the female they are half as long as the abdomen, lanceolate with the tip blunt. The posterior femora extend a little (female)

or one-third their length (male) beyond the abdomen. The posterior tibiæ are light (female) or very obscure (male) red infuscated at the apex.

Described from one female and one male, the latter collected by Mr. Coquillett at Los Angeles, the former bearing simply the label "California." All the specimens are in the collection of the National Museum. The male bears a very different appearance from the female with its very dark, nearly black color, more sloping face, longer tegmina and antennæ and more slender form, but the structure of the head and pronotum is exactly the same and I think that there is scarcely any doubt but that they belong to the same species.

#### VII. *OPEIA*, n. gen. Fig. 7.

Vertex nearly horizontal shorter than the distance between the eyes, convex, a little sulcate behind the prominent lateral carinæ which meet at an angle of about 90 degrees. Median carina distinct. Lateral foveolæ not visible from above, they are small sulci which extend from the ocelli toward the vertex and are not clearly separated from the front. The frontal costa is sulcate except at the apex, and its margins are slightly and regularly expanded downward. Seen from the side, the face is straight and strongly declivent. The antennæ are considerably flattened basally and regularly acuminate, distinctly shorter than the head and pronotum. The pronotum has the disk nearly plain, being slightly elevated to the median carina. This and the lateral carinæ are unusually heavy and distinct and all three are cut by the principal sulcus only much behind the middle. The lateral carinæ are very slightly divergent from the middle of the pronotum to the posterior margin which is roundly angulate. The lateral lobes of the pronotum are not quite so high as long; they are nearly perpendicular, being very slightly convex above, and they have a nearly horizontal carina extending from the middle to the posterior margin. They have the anterior and posterior borders strongly oblique with the lower margin nearly straight. There is no prosternal tubercle. The mesosternal lobes are separated (female) by a space about as long as wide, the metasternal lobes by a space longer than wide (female) or nearly contiguous (male). The tegmina are little shorter than the abdomen (female). The discoidal area is occupied by a weak intercalary vein. The scapular area is decidedly expanded in the male, and filled with a single series of moderately strong curved cross veins. The posterior femora

are not slender, they extend somewhat beyond the end of the abdomen. The valves of the ovipositor are but little exerted.

This genus is represented in North America by a single species. It, with *Pedeticum*, is a connecting link between *Mermiria* and *Napaia* on the one side and *Amphitoruus*, *Atkentetus*, and *Eritettix* upon the other.

*Oxycoryphus*, Thos., 1873. Syn. Acrid. N. Am., 72.

I. OPEIA OBSCURA, Thos. Fig. 7a, 7b, 7c.

*Oxycoryphus obscurus*, Thos., 1871. Pre. Rept. Surv. Mont., 446.

*Oxycoryphus obscurus*, Thos., 1873. Syn. Acrid. N. Am., 73.

*Oxycoryphus obscurus*, Bruner, 1883. 3rd Rept. U.S. Ent. Com., 55.

*Oxycoryphus obscurus*, Bruner, 1885. Bul. Wash. Col. Lab. Nat. Hist., I, No. 4, 130.

*Oxycoryphus obscurus*, Bruner, 1885. Rept. Com. Agr., 307.

This is an extremely variable species in every way. The coloration in particular is so variable that it is difficult to describe. In typical specimens the dorsum is brown or green, nearly plain with sometimes a streak of fuscous along the median carina. The sides are marked by a stripe which extends backward from the eye, widening and generally becoming more obscure. When most distinct, this stripe consists of five parts, as follows: an upper streak of brown or fuscous below the lateral carinæ, below this a lighter streak followed by a white line, and still below this the light and dark streak repeated. Apparently these five elements of the lateral stripe may be varied in intensity of coloration in any way so that the great dissimilarity in appearance is produced. Nearly always, however, all these parts can be distinctly or faintly seen, and in all cases the lower fifth of the pronotum at least is brown. The tegmina have the discoidal area occupied by a row of large usually distinct quadrate fuscous spots and the scapular area contains a whitish streak.

**Hab.** West of Missouri and Arkansas and east of the Rocky Mountains. This seems to be a species peculiar to the great plains. Its range is unusually great north and south, as it extends from the northern to the southern boundaries of the United States and probably much farther in each direction, while it is somewhat restricted east and west. Bruner says it "occurs where the grasses are short and the climate is arid," and reports it as common in the Yellowstone Valley. The National Museum contains two females and one male which seem

to be 'Thomas' type as they bear his label. His description of the species, however, was based upon the female. In addition to these are numerous specimens from Nebraska, Texas, and Wyoming. Two females from Texas are of larger size than the others, the lateral stripe is distinct and occupies the upper half of the lateral lobe of the pronotum, and the vertex is a little wider and more rounded.

### VIII. PEDETICUM, n. gen. Fig. 8.

This genus is very closely related to *Opeia*, and does not differ materially in the structure of the head except in the possession of supplementary lateral carinæ more or less distinct. In the following particulars it seems to be too different to be united with that genus. The pronotum has the lateral carinæ strongly sinuate a little in advance of the middle. None of the carinæ are cut by any of the sulci, and these are almost entirely obsolete. The anterior and posterior borders of the disk of the pronotum are straight. The mesosternal lobes are separated by a space decidedly (female) or a little broader than long, and the metasternal lobes are contiguous behind and inclose two very deep pits. The tegmina are abbreviated, less than one-half (female) or nearly three-fourths (male) as long as the abdomen. The valves of the ovipositor are moderately exerted.

This genus contains but one species which, in spite of its very different appearance, is really closely related to *Opeia obscurus*, Thos. I should have hesitated to erect this genus but that if it is not done Scudder's species would become a synonym and I should be compelled to give it a new specific name; and in case these species should afterwards be considered generically distinct (and this seems extremely probable as the tendency undoubtedly is to restrict more and more generic groups) there would be a useless synonym.

#### I. PEDETICUM OBSCURUM, Scud. Fig. 8a, 8b.

*Chrysochraon obscurus*, Scud., 1877 Ent. Notes, VI, 29.

*Chrysochraon obscurus*, Bruner, 1883. 3rd Rept. Ent. Com., 55.

**Hab.** Fort Reed, Florida.

As this specimen has not been reported in any other collection than that in which Dr. Scudder first found it there is little doubt but it is a local and very rare species. I have examined a specimen from Scudder's collection.

IX. **ERITETTIX**, Bruner. Fig. 9.

Head conical, occiput not elevated, furnished with three carinæ, one median and two supplementary; the former extends from the pronotum to the tip of the vertex where it is enlarged, the latter from the pronotum to a point opposite the anterior margin of the eyes where each suddenly bends to join the lateral carinæ of the vertex. The vertex is convex and equilaterally triangular. Its lateral carinæ are generally distinct, sometimes heavy, raised lines. The lateral foveolæ are present below the vertex, sub-triangular, not deeply impressed, sometimes not very apparent because of the slightness of the lower carinæ and because of their small size. The frontal costa has its sides somewhat regularly divergent from the vertex to the clypeus, generally a little constricted about the ocellus and slightly sulcate for a greater or less distance above this point but never sulcate to the vertex. The antennæ are thick, generally somewhat flattened at the base and clavate at the apex (except *variabilis*) which is bluntly acuminate and scarcely longer than the head and pronotum. The pronotum has the lateral and median carinæ distinct and cut once only by the principal sulcus decidedly behind the middle. In addition to these usual carinæ are two supplementary carinæ on either side about midway between the median and lateral carinæ. The posterior margin of the pronotum is very obtusely angulate. The lateral lobes of the pronotum are about as high as they are long, with the anterior border decidedly or little more oblique than the posterior. They have a more or less distinct carina which runs obliquely from the first sulcus to or toward the posterior margin. The anterior lower angle is obtuse, the posterior is rectangular. The lower margin is straight and horizontal on the posterior half, straight and slightly ascending on the anterior half. The mesosternal lobes are separated by a space much wider than long, and the metasternal lobes by a space longer than wide, in both sexes. The tegmina and wings are usually well developed (except *abortiva*). The former have the mediastine vein well developed, extending much beyond the middle of the wing and the scapular area in the male widened and filled with a series of rather weak and not very regular oblique veins. There is no intercalary vein and the dividing soon unites with the plicate vein. The ovipositor of the female is nearly included. The posterior femora are more than usually heavy, with the apex extending beyond the abdomen, and they are never banded. The posterior tibiæ are obscure or reddish, never blue, and the apical inner spur is about twice as long as the one behind it.

In part, *Stenobothrus*, Thos., 1873. Syn. Acrid. N. Am., 80.

In part, *Gomphocerus*, Thos., 1873. Syn. Acrid. N. Am., 96.

*Eritettix*, Bruner, 1889. Proc. U. S. Nat. Mus., XII, 56.

This genus does not seem to have been known to Brunner, as there is nothing in his key to fit it. It falls near his South American genus *Toxopterus*, but is very distinct from that. It appears to be a purely North American genus, therefore, and the species that belong to it are widely distributed.

#### KEY TO ERITETTIX, Bruner.

- A.<sup>1</sup> Lateral carinæ of the pronotum straight or very gently arcuate. Oblique carina of the lateral lobes very slender or nearly obsolete. Disk of the pronotum furnished with two narrow or broad, black, velvety stripes just inside of the lateral carinæ.
- B.<sup>1</sup> Supplementary carinæ of the pronotum about as strong as the median. Space between the supplementary carinæ carneous or brown, and the space between the supplementary carinæ and eyes and lateral carinæ velvety black.
- C.<sup>1</sup> Antennæ clavate.
- D.<sup>1</sup> Wings hyaline. . . . . 1.—*Virgatus*, Scud.
- D.<sup>2</sup> Wings fuliginous. . . . . 2.—*Carinatus*, Scud.
- C.<sup>2</sup> Antennæ acuminate, not clavate. . . . . 3.—*Variabilis*, Brun.
- B.<sup>2</sup> Supplementary carinæ of the pronotum much weaker than the median or obsolete. Space between the supplementary carinæ little if any darker than the median space.
- C.<sup>1</sup> Tegmina with the posterior half green or brown with a light yellow or green stripe in the scapular area extending from the base to the middle. . . . . 4.—*Tricarinatus*, Thos.
- C.<sup>2</sup> Tegmina testaceous. . . . . 5.—*Simplex*, Scud.
- A.<sup>2</sup> Lateral carinæ of the pronotum moderately arcuate before the middle. Oblique carina of the lateral lobes very heavy and generally white or light colored, at least on the apical half.
- B.<sup>1</sup> Tegmina as long as or longer than the abdomen. . . . . 6.—*Narvicutus*, Scud.
- B.<sup>2</sup> Tegmina abortive, a little (male) or not (female) more than half as long as the abdomen. . . . . 7.—*Abortivus*, Bruner.

#### 2. ERITETTIX VIRGATUS, Scud. Fig. 9a, 9b.

*Gomphocerus virgatus*, Scud., 1875. Cent. Orth., 23.

*Gomphocerus virgatus*, Bruner, 1883. 3rd Rept. Ent. Com., 56.



*Eritettix virgatus*, Bruner, 1889. Proc. U. S. Nat. Mus., XII, 56.

**Hab.** Apparently a rare species, it has heretofore been reported only from Texas. It occurs also in Arkansas.

2. ERITETTIX CARINATUS, Scud.

*Gomphocerus carinatus*, Scud., 1875. Cent. Orth., 23.

*Gomphocerus carinatus*, Bruner, 1889. Proc. U. S. Nat. Mus., XII, 56.

**Hab.** Middle States (Scud.).

I think there is little doubt but that this species is a variety of *E. virgatus* with fuliginous wings. I am unacquainted with it, however, and prefer to retain the name.

3. ERITETTIX VARIABILIS, Bruner.

*Eritettix variabilis*, Bruner, 1889. Proc. U. S. Nat. Mus., XII, 56.

**Hab.** Silver City, New Mexico (Bruner).

This species is distinguishable from all others of the genus in having the antennæ acuminate instead of clavate at the tip.

4. ERITETTIX TRICARINATUS, Thos.

*Stenobothrus tricarinatus*, Thos., 1873. Syn. Acrid. N. Am., 84.

*Stenobothrus tricarinatus*, Bruner, 1883. 3rd Rept. Ent. Com., 55.

*Stenobothrus tricarinatus*, Bruner, 1889. Proc. U. S. Nat. Mus., XII, 56.

*Stenobothrus tricarinatus*, Osborn, 1892. Proc. Iowa Acad. Sci., 1890-91, 4.

**Hab.** This species has been reported but once outside of Wyoming. Herbert Osborn gives it as not common in Iowa. The United States Museum contains numerous specimens from the first mentioned locality.

5. ERITETTIX SIMPLEX, Scud.

*Gomphocerus simplex*, Scud., 1869. Proc. Am. Ent. Soc., II, 305.

*Gomphocerus simplex*, Thos., 1873. Syn. Acrid. N. Am., 97.

*Gomphocerus simplex*, Bruner, 1877. Can. Ent., IX, 144.

*Gomphocerus simplex*, Bruner, 1883. 3rd. Rept. Ent. Com., 56.

**Hab.** Said by Scudder to occur in Delaware. It does not seem to have been recognized there since. It was reported by Bruner in 1877 in the Can. Ent., IX, 144, to occur in Nebraska. Since he gives Delaware as the only locality for this species in the 3rd Rept. Ent. Com., 56, in 1883, it is probable that he was mistaken in the first

reference. I am unacquainted with the species, but I think that it is probable that it is synonymous with *virgatus*.

6. ERITETTIX NAVICULUS, Scud.

*Gomphocerus navicula*, Scud., 1876. U. S. Geol. Surv. W. 100 Mer., App. JJ., 506.

*Gomphocerus navicula*, Bruner, 1883. 3rd. Rept. Ent. Com., 56.

**Hab.** Southern Colorado, Northern New Mexico, Montana. The National Museum contains Scudder's type from Southern Colorado, and another specimen from Montana. The latter does not agree closely with the type, but the divergence is no greater than should be expected in species so variable as the *Eritettix*.

7. ERITETTIX ABORTIVUS, Bruner.

*Eritettix abortivus*, Bruner, 1889. Proc. U. S. Nat. Mus., 56, pl. i, figs. 8 and 9.

**Hab.** Central Texas (Schaupp), Washington Co., Tex. (Bruner). This species is most nearly related to *naviculus*, but it is easily distinguished from that by its abortive tegmina and wings, its smaller size and very heavy and short antennæ.

X. SYRBULA, Stål. Fig. 10.

Head not much shorter than the pronotum with the occiput moderately rounded transversely, and slightly or considerably ascending. Vertex convex and more or less sulcate, horizontal and semi-elliptical or sub-triangular in shape with a distinct median carina not less apparent than the lateral carinæ, which are suddenly curved inward a short distance back of the anterior margin of the eye, and from that point together with the median carina are more or less distinctly continued to the pronotum. The lateral foveolæ, generally indistinct and small, are triangular in shape and invisible from above. The frontal costa is plain, a little convex or more or less sulcate, continued to or even upon the clypeus, decidedly constricted at the apex and very slightly at the ocellus. The antennæ are flattened decidedly at the base and distinctly acuminate (female) or are flattened moderately at the base and decidedly or strongly expanded apically and acuminate (male). The pronotum has the disk plain with the three carinæ distinct, the lateral being gently or strongly sinuate and very slightly or moderately divergent posteriorly. All are severed by a single sulcus

in or behind the middle. The metazone is sub-truncate or decidedly angulate. The lateral lobes of the pronotum are about as high as long with both the anterior and posterior margins moderately oblique, the latter generally sinuate and the lower margin nearly horizontal and scarcely perceptibly or very moderately angulate in the middle. Behind the principal sulcus the lateral lobes are generally deeply and thickly pitted. The mesosternal lobes are separated by a space not (male) or a little (female) broader than long, the metasternal lobes by a space longer than broad (female) or they are closed behind (male). The tegmina and wings are well developed, exceeding the abdomen. The former have a very different structure in the two sexes. In the male they are regularly reticulate everywhere except in the anal field and at the base of the scapular area which is opaque. This and the ulnar area being widened and furnished with a single series of conspicuous veins. In the female, they are irregularly reticulate throughout and not expanded in the ulnar or scapular areas. The legs are moderately or quite slender, their posterior femora much exceeding the abdomen even in the female, and the posterior tibiæ are furnished with 17 to 20 rather small spines. The ovipositor is moderately exerted and the last ventral segment of the male is acutely conical.

*Syrbula*, Stål, 1873. Recen. Orth., I, 90.

*Syrbula*, Bruner, 1893. Rev. Sys. Orth., 119.

*Oxycoryphus*, Sauss., 1861. Orth. Nov. Am., II, 16.

In part, *Stenobothrus*, Thos., 1873. Syn. Acrid. N. Am., 80.

This distinct North American genus contains four species as now determined, all of them being southern, though *S. admirabilis* extends as far north as northern Illinois.

KEY TO SYRBULA, Stål.

- A.<sup>1</sup> Median carina cut by two sulci . . . 1. — *Montezuma*, Sauss.
- A.<sup>2</sup> Median carina cut by the last sulcus only.
- B.<sup>1</sup> Lateral lobes of the pronotum either plainly punctate or furnished with elongate rugæ behind the principal sulcus.
- C.<sup>1</sup> Lateral carinæ of the pronotum generally sinuate. Posterior femora and tibiæ unusually long and slender, the latter with 19 (female) to 21 (male) spines on the outer edge . . . . . 2. — *Admirabilis*, Uhler.
- C.<sup>2</sup> Lateral carinæ of the pronotum strongly sinuate. Posterior femora and tibiæ moderately slender, but not longer than usual, the latter with 17 (male) spines on the outer edge . 3. — *Acuticornis*, Bruner.

B.<sup>2</sup> Lateral lobes of the pronotum smooth behind the principal sulcus.....4.—*Fuscovittata*, Thos.

1. SYRBULA MONTEZUMA, Sauss.

*Oxycoryphus montezuma*, Sauss., 1861. Orth. Nov. Am., Ser. II, 18.

*Oxycoryphus montezuma*, Walk., 1870. Cat. Derm. Salt., IV, 787.

*Oxycoryphus montezuma*, Thos., 1873. Syn. Acrid. N. Am., 204.

*Syrbula montezuma*, Stål, 1873. Rec. Orth., I, 102.

**Hab.** Mexico (Saussure).

This species is included in this genus on the authority of Stål as it is unknown to me. I am not inclined to think it is synonymous with *Admirabilis*, as has been suggested by Thomas and Bruner, because Stål probably knew the species and considered it distinct, and because there is at least one character given by Saussure which can not apply to *Admirabilis*. It is true that there is evidently a misconstruction in the text at the point referred to (pronoti carinæ tres sulci 2 sejunctis), but whether the figure 2 be translated by a cardinal as sulci would require, or by an ordinal as Thomas has assumed, the difficulty remains that in *Admirabilis* the median carina is cut but once and that very distinctly by the third sulcus.

2. SYRBULA ADMIRABILIS, Uhler.

*Stenobothrus admirabilis*, Uhler, 1864. Proc. Ent. Soc. Phil., II, 553.

*Stenobothrus admirabilis*, Thos., 1873. Syn. Acrid. N. Am., 84.

*Stenobothrus admirabilis*, Thos., 1876. Bul. I, Ill. Mus. Nat. Hist., Art. VII, 61.

*Stenobothrus admirabilis*, Bruner, 1883. 3rd Rept. U.S. Ent. Com., 55.

*Syrbula admirabilis*, Bruner, 1877. Can. Ent., IX, 144.

*Syrbula admirabilis*, Bruner, 1885. Bul. Wash. Col. Lab. Nat. Hist., Vol. I, No. 4, 131.

*Syrbula admirabilis*, McNeill, 1891. Psyche, VI, 65.

*Syrbula admirabilis*, Blatchley, 1891. Can. Ent., XXIII, 76.

*Syrbula admirabilis*, Garman, 1894. 6th Ann. Rept. Ky. Ag. Ex. Sta., 9.

*Syrbula admirabilis*, Beutenmüller, 1894. Desc. Cat. Orth., 292.

*Syrbula leucocera*, Stål, 1873. Rec. Orth., I, 102.

*Syrbula leucocera*, Thos., 1875. Rept. Geol. and Geog. Surv. W. 100 Mer., V Zool, 1869.

*Syrbula leucocera*, Bruner, 1885. Bul. Wash. Col. Lab. Nat. Hist., Vol. I, No. 4, 131.

? *Syrbula montezuma*, Townsend, 1893. *Ins. Life*, VI, 31.

**Hab.** United States east of the Rocky Mountains, extending as far north as Nebraska and Northern Illinois and on the Atlantic coast to Maryland. If the species determined by Bruner and reported by Townsend is *admirabilis*, it is also found between the Rocky and the Sierra Nevada Mountains. The United States Museum contains numerous specimens from Illinois, Missouri, Arkansas, Texas, and Georgia.

3. *SYRBULA ACUTICORNIS*, Bruner. Fig. 10, 10b.

*Syrbula acuticornis*, Bruner, 1889. *Proc. U. S. Nat. Mus.*, XII, 55.

**Hab.** Southwestern Texas (Bruner); Fort Grant, Arizona. The National Museum contains several specimens (males) from the last-mentioned locality which have been doubtfully referred to *S. fusca-vittata*, Thos. They do not fit Thomas' description of that species, however, in having the lateral lobes of the pronotum not smooth behind the principal sulcus, but punctate. I think there is little doubt but the specimens in question belong to Bruner's species. The National Museum also contains two of Bruner's types (females).

4. *SYRBULA FUSCA-VITTATA*, Thos.

*Syrbula fusca-vittata*, Thos., 1875. *Rept. Geol. and Geog. Surv. W. 100 Mer.*, V, *Zool.*, 870, pl. xlv, fig. 7.

**Hab.** Lower Arizona (Thomas).

I am not acquainted with this species; it may be that it is identical with Bruner's *acuticornis*.

## XI. *AMPHITORNUS*, n. gen. Fig. 11.

Vertex a little declivent, advanced in front of the eyes less than half the distance between the eyes, convex, with slight sulci on either side of the median carina. Lateral carinæ are scarcely at all perceptible. Tempora rather broad, not at all foveolate, and no more clearly separated from the vertex than from the front. Frontal costa rather broad, not sulcate, barely depressed at the ocellus with the margins very moderately divergent below. The antennæ are distinctly shorter (female) or not longer (male) than the head and pronotum, flattened in both sexes, more or less acuminate in the female, linear in the male. Pronotum with the disk well rounded and the lateral carinæ, if present at all, extremely faint and not interfering at all with

rounded outline of the humeral angles. The median carina is distinct and accompanied by more or less distinct supplementary carinæ on the disk. All of these are cut by the last principal sulcus only, a little or considerably behind the middle. The posterior angle of the disk is moderately rounded. The lateral lobes of the pronotum are a little higher than long with the anterior margin strongly oblique, the posterior margin perpendicular and the lower margin slightly angulate. The mesosternal lobes are separated by a space broader than (female) or as broad as long (male), and the metasternal lobes by a space longer than broad (female) or very nearly approximate (male). The tegmina are well developed, with the scapular area of the male expanded, hyaline and filled with rather prominent cross veins. The discoidal area has no intercalary vein, and the dividing is soon united with the plicate vein. The posterior femora are banded with fuscus on the upper and inner faces. The upper valves of the ovipositor are included, the lower valves slightly exerted. The posterior tibiæ are bluish, with the apical inner spur sub-equal to the one behind it, much less than twice as long.

This genus includes two western species, it is closely related to the following genus and less intimately to *Eritettix*. From the last-mentioned genus it is easily distinguished by the absence of lateral carinæ upon the top of the head, and the median carina except at the vertex, by the absence of the club to the antennæ, by the rounded disk of the pronotum and the obsolete lateral carinæ, by the banded hind femora, the blue hind tibiæ with sub-equal inner apical spurs, and by the unspotted tegmina.

#### KEY TO AMPHITORNUS, n. gen.

- A.<sup>1</sup> Median carina cut very little behind the middle . . . . . :  
 . . . . . 1.—*Bicolor*, Thos.  
 A.<sup>2</sup> Median carina cut decidedly behind the middle. 2.—*Ornatus*, n.sp.

#### 1. AMPHITORNUS BICOLOR, Thos. Fig. 11a, 11b.

*Stenobothrus bicolor*, Thos., 1872. Prelim. Rept. U. S. Geol. Surv. Mont., 465.

*Stenobothrus bicolor*, var. a., Thos., 1872. Prelim. Rept. U. S. Geol. Surv. Mont., 465.

*Stenobothrus coloradus*, Thos., 1873. Syn. Acrid. N. A., 82.

*Stenobothrus coloradus unicolor*, Thos., 1873. Syn. Acrid. N. Am., 83.

*Stenobothrus coloradus*, Thos., 1876. Proc. Dav. Acad. Nat. Sci., 1, 251.

*Stenobothrus coloradus*, Bruner, 1883. 3rd. Rept. U. S. Ent. Com., 55.

*Stenobothrus coloradus*, Bruner, 1885. Bul. Wash. Col. Lab. Nat. Hist., I, No. 4, 131.

*Stenobothrus coloradus*, Bruner, 1885. Rept. Com. Agr., 307.

**Hab.** Montana, Wyoming, and Colorado, east of the Rocky Mountains, Kansas and Nebraska.

This, like *Opeia obscurus*, Thos., is a species of the great plains. It is reported by Bruner as very common in the Yellowstone Valley. The National Museum contains Thomas' types and specimens from Nebraska, Wyoming, Colorado, and Montana.

2. AMPHITORNUS ORNATUS, n. sp.

*Stenobothrus coloradus*, Koebele, 1890. Bul. 22, Div. Ent., 94.

This species is closely allied to the preceding, but the following differences appear: The head and pronotum in this species are longer, and the face is distinctly more oblique in both sexes. The antennæ of the female are more depressed and distinctly acuminate. The median carina is cut decidedly behind the middle. The colors are brighter and more strongly contrasted. The posterior tibiæ are bright blue.

Described from several specimens from Los Angeles, California, which now belong to the United States National Museum.

XII. AKENTETUS, n. gen. Fig. 12.

This genus is closely related to *Amphitornus*. It differs in the somewhat longer and considerably deeper sculpturing of the head, but especially in the structure of the pronotum which is nearly plain above with the lateral carinæ faint except upon the anterior part of the prozone and the metazone and considerably divergent from the middle sulcus to the posterior margin. These are cut by all three transverse sulci. The median carina is faint and cut near the middle by the principal sulcus only. There are no traces of supplementary carinæ. The color is nearly uniform brown.

This genus contains a single species found in Colorado.

AKENTETUS UNICOLOR, n. sp. Fig. 12a, 12b.

Length (male) ..... 18.5 mm.  
 Tegmina ..... 16 mm.  
 Post. Fem. .... 12.5 mm.

Color dark, dull brown with a narrow stripe of fuscous, which is not at all conspicuous on account of the dark ground color, extending from the upper margin of the eye along the lateral lobes of the pronotum just outside of the lateral carinæ. The posterior femora have the outer face marked with three distinct black bands and the knee is black. All these black marks are extended across the upper face and upon the inside. The posterior tibiæ are bluish.

Described from a single male from Colorado.

### XIII. AMBLYTROPIDIA, Stål. Fig. 13.

Vertex extended considerably in front of the eyes, plainly declivent and roundly united with the front from which it is separated by lateral carinæ which are almost obsolete or moderately distinct. It is convex and shallowly or scarcely sulcate with a plain median carina. The lateral foveolæ are wanting. The frontal costa is plain or sulcate with elevated lateral carinæ. The face seen from the side is nearly straight. The antennæ are filiform or slightly enlarged apically and heavy, scarcely as long as the head and pronotum. The pronotum has the disk plain with the carinæ, more especially the median, distinct and parallel or the lateral slightly divergent. The median carina is cut near or distinctly behind the middle and the metazone is sharply but very obtusely angulate. The lateral lobes of the pronotum are at least as high as broad with the anterior border moderately oblique, the posterior sub-vertical and the lower a little descending posteriorly, more decidedly ascending anteriorly. The lobes of the mesosternum are separated by a space about as broad as long (male and female) and the metasternal lobes are contiguous behind. The tegmina and wings are well developed with the scapular area of the former not expanded nor hyaline nor regularly veined. The posterior femora are decidedly heavy with the base unusually convex on the outer face. The valves of the ovipositor are exerted.

*Amblytropidia*, Stål, 1873. Recen. Orth., I, 93.

*Amblytropidia*, Bruner, 1893. Rev. Syst. Orth., 120.

This American genus contains three species, *A ferruginea*, Stål, from Brazil and the two enumerated below from North America.

#### KEY TO AMBLYTROPIDIA, Stål.

- A.<sup>1</sup> Median carina of the pronotum cut in the middle. Dorsum of the abdomen brownish. . . . . 1.— *Occidentalis*, Sauss.



A.<sup>2</sup> Median carina of the pronotum cut much behind the middle. Dorsum of the abdomen reddish orange..2.—*Auriventris*, Bruner.

1. AMBLYTROPIDIA OCCIDENTALIS, Sauss. Fig. 13a, 13b.

*Stenobothrus occidentalis*, Sauss., 1861. Orth. Nov. Am., Ser. II, 19.

*Stenobothrus occidentalis*, Walk., 1870. Cat. Derm. Salt., IV, 755.

*Amblytropidia subhyalina*, Scud., 1875. Cent. Orth., 23.

*Amblytropidia subhyalina*, Scud., 1877. Ent. Notes, VI, 29.

*Amblytropidia subhyalina*, Bruner, 1883. 3rd Rept. Ent. Com., 58.

*Amblytropidia subhyalina*, Schufeldt, 1884. Proc. U. S. Nat. Mus., VII, 332.

*Chloëaltis (Amblytropidia) subhyalina*, Provancher, 1877. Faune Entom. du Can., 44.

**Hab.** The Gulf States of the United States north of Tennessee and Georgia and west to Colorado and Arizona. Abbé Provancher implies that a specimen of this species in his collection was found in Canada. Its occurrence there seems improbable.

2. AMBLYTROPIDIA AURIVENTRIS, Bruner.

*Amblytropidia auriventris*, Bruner.

**Hab.** Orizaba, Mexico.

XIV. CHLOËALTIS, Harr. Fig. 14.

Vertex triangular, a little declivent, not extending in front of the eyes as much as the distance between the eyes, convex, more or less sulcate, with the lateral carinæ little elevated and the median carina slight but never entirely wanting. The lateral foveolæ are wanting. The frontal costa is more or less rounded above the ocellus, plain or very faintly sulcate below with the sides sub-parallel. The antennæ are decidedly flattened at the base and much longer than the head and pronotum together, in the male as long as the hind femora. The face seen from the side is nearly straight. The pronotum has the disk plain with the three carinæ equally distinct and cut much behind the middle with the last transverse sulcus. The lateral carinæ are plainly (male) or strongly (female) curved. The posterior margin of the meta-zone is straight or gently curved, not angulate. The lateral lobes of pronotum are longer than high, with the anterior and posterior margins straight and strongly and equally oblique, and with the lower margins horizontal or slightly descending posteriorly, more decidedly

ascending anteriorly. Mesosternal lobes separated by a space much broader than long, the metasternal lobes by a space broader than long (female) or about as broad as long (male). The tegmina are generally abortive (female) or well developed (male). The scapular area is unusually expanded, especially near and beyond the middle in the male (and in the female to a less extent when the tegmina are not abortive), and is filled with a series of strong oblique cross-veins. The discoidal is as broad as the ulnar area, and the intercalary vein is present. The posterior femora are rather slender or moderately robust and more or less distinctly banded above. The posterior tibiæ have the apical spurs on the inside about equal.

This North American genus contains two species, one from the north-eastern and one from the north-western United States.

In part, *Locusta* (*Chloëaltis*), Harr., 1852. Treat. Ins. Inj. to Veg., 160.

In part, *Locusta* (*Chloëaltis*), Harr., 1862. Treat. Ins. Inj. to Veg., 184.

In part, *Chloëaltis*, Scud., 1862. Jour. Bost. Soc. Nat. Hist., VII, 456.

In part, *Chloëaltis*, Thos., 1880. 9th Rept. Ins. Ill., 84.

In part, *Chloëaltis*, Brunner, 1893. Rev. Sys. Orth, 119.

*Chloëaltis*, Morse, 1896. Psyche, VII, 327, fig. 11, 11a, and 419.

In part, *Chrysochraon*, Thos., 1873. Syn. Acrid. N. Am., 74.

In part, *Stenobothrus*, Scud., 1862. Jour. Bost. Soc. Nat. Hist., VII, 456.

In part, *Truxalis*, Thos., 1876. Bul. I, Ill. Mus. Nat. Hist., 61.

#### KEY TO CHLOËALTIS, Harr.

- A.<sup>1</sup> Posterior margin of the disk of the pronotum straight, lateral lobes of the pronotum of the male black. . . . 1.— *Conspersa*, Harr.  
 A.<sup>2</sup> Posterior margin of the disk of the pronotum obtusely rounded, lateral lobes of the pronotum of the male not black. . . . .  
 . . . . . 2.— *Abdominalis*, Thos.

#### 1. CHLOËALTIS CONSPERSA, Harr. Fig. 14a, 14b.

*Locusta* (*Chloëaltis*) *conspersa*, Harr., 1852. Treat. Ins. Inj. Veg., 160.

*Locusta* (*Chloëaltis*) *conspersa*, Harr., 1862. Treat. Ins. Inj. Veg., 184.

*Chloëaltis* *conspersa*, Scud., 1862. Can. Nat., VII, 286.

*Chloëaltis* *conspersa*; Scud., 1862. Journ. Bost. Soc. Nat. Hist., VII, 455.

*Chloëaltis conspersa*, S. I. Smith, 1868. Proc. Port. Soc. Nat. Hist., I, 145.

*Chloëaltis conspersa*, S. I. Smith, 1872. Rept. Sec. Agr. Conn., 375.

*Chloëaltis conspersa*, Scud., 1874. Fin. Rept. Geol. N. H., I, 570, fig. 55-56.

*Chloëaltis conspersa*, Scud., 1875. Brit. N. Am. Bound. Com., 286.

*Chloëaltis conspersa*, Fernald, 1887. Orth. N. E., 36.

*Chloëaltis conspersa*, Caulfield, 1887. 18th Rept. Ent. Soc. Ont., 70.

*Chloëaltis conspersa*, Davis, 1889. Ent. Am., V, 78 and 81.

*Chloëaltis conspersa*, McNeill, Psyche, VI, 65.

*Chloëaltis conspersa*, Scud., 1893. 23rd Ann. Rept. Ent. Soc. Ont., 75, fig. 50 and 51.

*Chloëaltis conspersa*, Garman, 1894. 6th Ann. Rept. Ky. Agr. Ex. Sta., 8.

*Chloëaltis conspersa*, Morse, 1894. Psyche, 13 and 104.

*Chloëaltis conspersa*, Blatchley, 1894. Can. Ent., XXVI, 222.

*Chloëaltis conspersa*, Morse, 1896. Psyche VII, 327, fig. 11, 11a, and 419.

*Stenobothrus conspersus*, Walk., 1870. Cat. Derm. Salt., IV, 755.

*Chrysochraon conspersum*, Thos., 1873. Syn. Acrid. N. Am., 76.

*Chrysochraon conspersum*, Bruner, 1877. Can. Ent., IX, 144.

*Chrysochraon conspersum*, Bruner, 1883. 3rd Rept. U. S. Ent. Com., 55.

*Chrysochraon conspersum*, Blatchley, 1891. Can. Ent., XXIII, 75.

*Chrysochraon conspersum*, Osborn, 1892. Proc. Iowa Acad. Sci., 1890-91, 4.

*Truxalis conspersa*, Thos., 1876. I, Bul. Ill. Mus. Nat. Hist., 61.

*Locusta (Chloëaltis) abortiva*, Harr., 1852. Treat. Ins. Inj. Veg., 160.

*Locusta (Chloëaltis) abortiva*, Harr., 1862. Treat. Ins. Inj. Veg., 184.

*Stenobothrus melanopleurus*, Scud., 1862. Jour. Bost. Soc. Nat. Hist., VII, 456.

*Stenobothrus melanopleurus*, Walk., 1870. Cat. Derm. Salt., IV, 754.

**Hab.** Canada as far north as the shores of Lake Winnipeg; United States, Nebraska to New England and south to Ohio, Indiana, and Illinois.

This species has only been reported once as far west as Nebraska (Bruner, 1877), and it is not unlikely that this reference was mistaken.

## 2. CHLOËALTIS ABDOMINALIS, THOS.

*Chrysochraon abdominalis*, Thos., 1873. Syn. Acrid. N. Am., 74.

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*Chrysochraon abdominalis*, Bruner, 1883. 3rd Rept. U. S. Ent. Com., 55.

**Hab.** Montana.

The types are in the National Museum. The species has not been reported since it was named by Thomas.

XV. **DICHROMORPHA**, Morse. Fig. 15.

Vertex much shorter than broad, somewhat declivent, convex, but more or less sulcate behind the distinct elevated lateral carinæ. These are straight or gently curved and meet at an angle of 90 degrees or more in a blunt point. The median carina is entirely wanting, as are the lateral foveolæ. The frontal costa is sulcate above and below the ocellus with the sides gently divergent downward, more or less constricted just below the ocellus and near the vertex. The face seen from the side is nearly straight. The antennæ are a little longer (male) or scarcely so long as (female) the head and pronotum. The disk of the pronotum is plain with the three carinæ very nearly straight and parallel. All are cut distinctly behind the middle by the very faint principal sulcus. The first and second transverse sulci are not visible upon the disk. The lateral lobes of the pronotum are perpendicular, longer than high, with the anterior and posterior margins strongly oblique, the latter plainly sinuate and the lower margin a little descending posteriorly, more strongly ascending and sinuate anteriorly. The lobes of the mesosternum are separated by a space broader than long (female) or as broad as long (male). The lobes of the metasternum are separated in the female by a space as long as broad, in the male they are contiguous. The tegmina are generally abortive, sometimes well developed, in which case the scapular area is not expanded. The anal field of the tegmina meets the discoidal field at an angle. The posterior femora are stout and not banded. The posterior tibiæ are obscurely colored with the apical spurs on the inner side not very unequal. The valves of the ovipositor are moderately exerted.

*Dichromorpha*, Morse, 1896. Psyche, VII, 326, fig. 1, 7, 7a, 7b.

In part, *Chloëaltis*, Scud., 1862. Journ. Bost. Soc. Nat. Hist., VII, 445.

In part, *Chloëaltis*, Bruner, 1893. Rev. Syst. Orth., 119.

In part, *Opsomala*, Thos., 1865. Trans. Ill. Agr. Soc., 451.

In part, *Chrysochraon*, Thos., 1873. Syn. Acrid. N. Am., 75.

In part, *Truxalis*, Stål, 1873. Recen. Orth., I, 92.

In part, *Truxalis*, Thos., 1876. Bul. Ill. Mus. Nat. Hist., I, 61.

KEY TO DICHROMORPHA, Morse.

- A.<sup>1</sup> Lateral carinæ of the pronotum perceptibly sinuate about the middle and a little less distant at this point than on the metazone. . . . . 1.—*Viridis*, Scud.  
 A.<sup>2</sup> Lateral carinæ of the pronotum perceptibly arcuate about the middle and more distant at this point than on the metazone . . . . . 2.—*Brunnea*, Scud.

I. DICHROMORPHA VIRIDIS, Scud.

*Chloëaltis viridis*, Scud, 1862. Jour. Bost. Soc. Nat. Hist., VII, 455.  
*Chloëaltis viridis*, S. I. Smith, 1872. Rept. Sec. Agr. Conn., 374.  
*Chloëaltis viridis*, Scud., 1877. Ent. Notes, VI, 29.  
*Chloëaltis viridis*, Bruner, 1883. 3rd Rept. U. S. Ent. Com., 58.  
*Chloëaltis viridis*, Fernald, 1887. Orth. New Eng., 36.  
*Chloëaltis viridis*, Davis, 1889. Ent. Am., V, 81.  
*Chloëaltis viridis*, McNeill, 1891. Psyche, VI, 64.  
*Chloëaltis viridis*, Garman, 1894. 6th Ann. Rept. Ky. Agr. Ex. Sta., 8.  
*Chloëaltis viridis*, Morse, 1894. Psyche, VII, 14.  
*Chloëaltis viridis*, Beutenmüller, 1894. Desc. Cat. Orth., 292, pl. vii, fig. 10.  
*Chloëaltis viridis punctulata*, Beutenmüller, 1894. Desc. Cat. Orth., 292-  
*Stenobothrus viridis*, Walk., 1870. Cat. Derm. Salt., IV, 755.  
*Chrysochraon viridis*, Thos., 1873. Syn. Acrid. N. Am., 75.  
*Chrysochraon viridis*, Scud., 1874. Fin. Rept. Geol. N. H., 372.  
*Chrysochraon viridis*, Bruner, 1877. Can. Ent., IX, 144.  
*Chrysochraon viridis*, Bruner, 1885. Bul. Wash. Col. Lab. Nat. Hist., I, No. 4, 131.  
*Chrysochraon viridis*, Blatchley, 1891. Can. Ent., XXIII, 75.  
*Chrysochraon viridis*, J. B. Smith, 1892. Bul. 90, N. J. Agr. Exp. Sta., 31, pl. i, fig. 5.  
*Chrysochraon viridis*, Osborn, 1892. Proc. Iowa Acad. Sci., 1890, 914.  
*Chrysochraon viridis*, Blatchley, 1894. Can. Ent., XXVI, 221.  
*Truxalis viridis*, Thos., 1876. Bul. Ill. Mus. Nat. Hist., I, 61.  
*Dichromorpha viridis*, Morse, 1896. Psyche, VII, 326, fig. 7, 7a, 7b.  
*Chloëaltis punctulata*, Scud., 1862. Journ. Bos. Soc. Nat. Hist., VII, 455.

*Chloëaltis punctulata*, Fernald, 1887. Orth. New Eng., 36.

*Chloëaltis punctulata*, Bruner, 1885. Rept. Com. Agr., 307.

*Chloëaltis punctulata*, Morse, 1894. Psyche, VII, 14, 104.

*Stenobothrus punctulata*, Walk., 1870. Cat. Derm. Salt., IV, 755.

*Chrysochraon punctulatum*, Thos., 1873. Syn. Acrid. N. Am., 76.

*Chrysochraon punctulatum*, Bruner, 1877. Can. Ent., IX, 144.

*Chrysochraon punctulatum*, Bruner, 1883. 3rd Rept. U. S. Ent. Com., 55.

*Opsomala brevipennis*, Thos., 1865. Trans. Ill. Agr. Soc., V, 451.

*Truxalis angusticornis*, Stål, 1873. Recen. Orth., 1, 105.

*Truxalis angusticornis*, Thos., 1875. Rept. Geog. and Geol. Surv. W. 100 Mer., V, Zool., 871.

**Hab.** The United States east of the Rocky Mountains except Texas and the extreme Southwest.

This is one of the commonest and most widely spread species in North America.

2. DICHROMORPHA BRUNNEA, Scud. Fig. 15a, 15b.

*Chloëaltis brunnea*, Scud., 1875. Cent. of Orth., 22.

*Chloëaltis brunnea*, Bruner, 1883. 3rd Rept. U. S. Ent. Com., 58.

**Hab.** Florida (Scudder).

I have seen a typical specimen from Scudder's collection.

XVI. CLINOCEPHALUS, Morse. Fig. 16.

Vertex horizontal, triangular, sulcate, without a median carina, much shorter than the distance between the eyes, with strongly elevated lateral carinæ. Lateral foveolæ wanting. Frontal costa acuminate above, sulcate throughout, with the heavy lateral carinæ regularly divergent below. Face a very little arcuate. The antennæ a little longer than the head and pronotum (male), sub-filiform, with the seventh to eleventh joints expanded laterally on the inner side so as to make them obscurely serrate at that point. The pronotum has the disk nearly plain with the three carinæ heavy and distinct and plainly cut much behind the middle by the principal sulcus only. The lateral carinæ are parallel on the prozone, very slightly divergent on the metazone. The posterior margin of the metazone is very gently arcuate. The lateral lobes of the pronotum are slightly convex above with the anterior margin straight and strongly oblique, the posterior margin oblique and decidedly sinuate above the lower angle and the lower

margin decidedly angulate in the middle. The lobes of the mesosternum are separated by a space longer than broad (male). The metasternal lobes are contiguous. The tegmina and wings are well developed and not longer than the abdomen. In both the ulnar area is very greatly expanded in the middle and the discoidal area is narrow. The posterior femora are not banded. The posterior tibiæ have the apical spurs on the inner side not very unequal. The anterior and middle femora are somewhat inflated.

*Clinocephalus*, Morse, 1896. Psyche, VII, 326, fig. B, Ba.

I. CLINOCEPHALUS ELEGANS, Morse. Fig. 16a.

*Clinocephalus elegans*, Morse, 1896. Psyche, VII, 326, fig. B, Ba.

**Hab.** Long Island, New Jersey, Maryland, Georgia, (Morse).

XVII. ORPHULA, Stål. Fig. 17a, 17b, 17c, 17d.

Vertex nearly horizontal, never extending in front of the eyes a distance greater than its own width, always more or less sulcate, with or without a faint median carina. The lateral foveolæ are obsolete or distinct, elongate triangular, or linear, not visible from above. The frontal costa is plain or sulcate with the sides nearly straight and very moderately divergent. The face is nearly straight or a little arcuate, never at all sinuate. The antennæ are filiform, sometimes depressed and acuminate at the apex. The pronotum has the disk nearly plain, with the median carina cut in or behind the middle. The lateral carinæ are generally decidedly or strongly sinuate, rarely nearly straight and divergent from the front border, or from the first and second sulcus. Very rarely they are nearly parallel. The lateral lobes of the pronotum have the anterior border decidedly oblique and straight or a little arcuate, the posterior border is less oblique and more or less sinuate and the lower border is decidedly angulate in the middle. The mesosternal lobes are separated by a space broader than long (female) or about as broad as long (male) and the metasternal lobes by a space not broader than long (female) or they are contiguous (male). The tegmina and wings are well developed, a little shorter or much longer than the abdomen. The former are very narrow with the scapular area not more expanded in the male than in the female. The discoidal area is destitute of the intercalary vein and the ulnar area in the male is sometimes much widened and regularly reticulate. The posterior femora are moderately slender or rather heavy. The

apical spurs on the inner side of the posterior femora are never very unequal. The valves of the ovipositor are moderately exerted.

*Truxalis (Orphula)*, Stål, 1873. Recen. Orth., I, 105.

In part, *Stenobothrus*, Scud., 1861. Jour. Bost. Soc. Nat. Hist., VII, 456.

In part, *Stenobothrus*, Thos., 1873. Syn. Acrid. N. Am., 80.

*Orphula*, Boliv., 1888. Ex. Mem. Soc. Zool. France, 27.

*Orphula*, Brunner. Rev. Sys. Orth., 119.

*Orphula*, Morse, 1896. Psyche, VII, 326, fig. 8, 10a.

This genus is given by Stål as a sub-genus of *Truxalis*. It was founded upon *T. pagana*, Stål, *T. plebeia*, Stål, *T. intricata*, Stål, and *Acridium punctatum*, De G. The first and third mentioned are South American species; the second is from Honolulu; and the fourth from Surinam, Rio Janeiro and Columbia. It is represented in North America and the West Indies by seven species.

#### KEY TO ORPHULA, Stål.

- A.<sup>1</sup> Discoidal field of the tegmina (female) scarcely narrowing distally where it is occupied nearly always by more than one row of cells and is little if any narrower than the ulnar area at its widest part. The ulnar area in the male is either divided into two series of cells by a more or less distinct false vein or it is irregularly reticulate, never occupied throughout with a single series of perpendicular or oblique cross-veins. The tegmina extend beyond the tips of the posterior femora always.
- B.<sup>1</sup> Antennæ very slender, very slightly depressed and not somewhat suddenly constricted near the tip and acuminate, as long as the head and pronotum even in the female. Lateral carinæ of the pronotum most nearly approximate at the second transverse sulcus. . . . . 1.—*Pelidna*, Burm.
- B.<sup>2</sup> Antennæ not very slender, strongly depressed, somewhat suddenly constricted near the apex and acuminate, shorter than the head and pronotum (female) or but little longer (male). Lateral carinæ of the pronotum most nearly approximate at the transverse sulcus. . . . . 2.—*Olivacca*, Morse.
- A.<sup>2</sup> Discoidal area of the tegmina of the female generally plainly narrowed distally where it is nearly always occupied by a single row of cells, and is plainly narrower than the ulnar area at its widest part. The ulnar area in the male is occupied by a single series of transverse veins. The tegmina rarely exceeding the abdomen (female) or the tip of the posterior femora (male).



- B.<sup>1</sup> Lateral carinæ sub-straight and parallel. . . . . 3.—*Decora*, n. sp.  
 B.<sup>2</sup> Lateral carinæ either strongly constricted, or if not they are strongly divergent on the metazone.  
 C.<sup>1</sup> Lateral carinæ more nearly approximate at the second sulcus than at the anterior margin of the pronotum. Posterior margin of the metazone gently angulate or obscurely rounded. Median carina cut decidedly behind the middle.  
 D.<sup>1</sup> Lateral foveolæ of the vertex generally very obscure, always triangular and basal. Head not very much shorter than the pronotum. Antennæ as long as (female) or longer than the head and pronotum and not acuminate at the apex. 4.—*Speciosa*, Scud.  
 D.<sup>2</sup> Lateral foveolæ of the vertex distinct and sub-linear. Head much shorter than the pronotum. Antennæ scarcely as long as (male) or much shorter than (female) the pronotum, and distinctly acuminate at the tip . . . . . 5.—*Tepanica*, Sauss.  
 C.<sup>2</sup> Lateral carinæ not more nearly approximate at any part of the pronotum than at the anterior margin.  
 D.<sup>1</sup> Median carina of the pronotum cut in the middle. Lateral carinæ of the pronotum gently divergent on the prozone, decidedly on the metazone. Posterior margin of the metazone strongly angulate . . . . . 6.—*Orizabæ*, n. sp.  
 D.<sup>2</sup> Median carina of the pronotum cut behind the middle. Lateral carinæ parallel on the prozone . . . . . 7.—*Scudleri*, Boliv.  
 . . . . . 8.—*Punctata*, De Geer.

I. ORPHULA PELIDNA, Burm.

Length (male) . . . . .	16 - 19	mm.	(female) . . . . .	20 - 24	mm.
Tegmina (male) . . . . .	14 - 17.5	mm.	(female) . . . . .	18 - 20	mm.
Antennæ (male) . . . . .	7 - 10	mm.	(female) . . . . .	8.5 - 10	mm.
Post. Fem. (male) . . . . .	9.5 - 11	mm.	(female) . . . . .	12 - 14	mm.

The scutellum does not extend in front of the eyes a distance equal to the width between the eyes, its sides meet in an angle a little greater (female) less (male) than a right angle, a sub-crescent shaped transverse sulcus extends from eye to eye, which is not interrupted by any trace of a longitudinal median carina. The lateral foveolæ are generally quite distinct and deep, elongate triangular in shape. The frontal costa is shallowly sulcate with the walls more divergent than in *speciosa*. The eyes are from one and one-half (female) to nearly twice (male) as long as the groove below the eye. The antennæ are little or not at all depressed, longer than the head and pronotum, decidedly

(male) or a little (female), with the segments near the middle from three to four times as long as wide. The pronotum has the three carinæ quite distinct, the two lateral carinæ being strongly divergent on the metazone and more nearly approximate upon the prozone than in *speciosa*. They are most nearly approximate at the second sulcus. All the carinæ are cut very near the middle by the principal transverse sulcus.

The tegmina surpass the femora slightly (female) or considerably (male). The ulnar area of the tegmina is usually little or no broader than the intercalary and the latter is occupied even distally by two or more rows of cells. The former is never, as in *speciosa*, occupied in the male by a single row of cells.

This species is extremely variable in color, but brown and fuscous are the predominant tints. In some specimens brown is replaced by various shades of green on the face, cheeks, occiput, disk and lower part of the lateral lobes of the pronotum, anal and costal fields of the tegmina. In these and other light colored specimens the fuscous stripe behind the eye is quite broad especially in the male; in many dark specimens, especially in the male, the fuscous stripe expands so as to cover nearly the whole of the lateral lobes of the pronotum; generally, however, there is to be seen more or less of lighter sometimes strongly contrasting color along the anterior and lower margins. The lateral carinæ are nearly always sharply outlined with yellowish brown or green which cuts the fuscous band on the metazone. The disk of the pronotum is sometimes dark except for a broad median light stripe. The tegmina are commonly brown and the whole radial field is usually mottled with lighter and darker brown or fuscous. The posterior femora are brown with the outer face more or less infuscated, sometimes with traces of transverse brown bands. The posterior tibiæ are greenish yellow or obscure brown or plumbeous with the darker basal half interrupted by a somewhat conspicuous light annulus a short distance below the knee.

When compared with *speciosas*, the color is more mottled, especially on the sides and in the radial field of the elytra and green specimens are much less common.

This species can be distinguished from *speciosas* by the length of the tegmina, by the fact that the antennæ are longer than the head and pronotum and little or not at all depressed, by the narrower ulnar area of the tegmina never (in the male) occupied by a single row of cells, by the more compressed prozone and by the absence of the faint

median carina present on the scutellum of *speciosa*. It is readily distinguished from *olivacea*, Morse by the antennæ which are not short and plainly depressed, with the apex acuminate, as in that species, by the lateral carinæ which are convergent only to the first sulcus in *olivacea* instead of to the second as in this.

*Gomphocerus pelidnus*, Burm., 1838. Handb. Ent., II, 650.

*Gomphocerus pelidnus*, Walk., 1870. Cat. Derm. Salt., IV, 784.

*Gomphocerus pelidnus*, Thos., 1873. Syn. Acrid. N. Am., 95.

*Gomphocerus pelidnus*, Bruner, 1883. 3rd Rep. Ent. Com., 56.

*Gomphocerus pelidnus*, Morse, 1894. Psyche, VII, 104.

In part, *Gomphocerus maculipennis*, Scud., 1862. Bost. Jour. Nat. Hist., VII, 458.

*Gomphocerus maculipennis*, S. I. Smith, 1868. Proc. Port. Soc. Nat. Hist., I, 148.

*Gomphocerus maculipennis*, Walk., 1870. Cat. Derm. Salt., IV, 754.

*Gomphocerus maculipennis*, Thos., 1872. Syn. Acrid. N. Am., 86.

*Gomphocerus maculipennis*, Thos., 1872. Prelim. Rept. U. S. Geol. Surv. Mont., 430.

*Gomphocerus maculipennis*, S. I. Smith, 1872. Rept. Sec. Agr. Conn., 376.

*Gomphocerus maculipennis*, Scud., 1874. Fin. Rept. Geol. N. H., I, 373.

In part, *Gomphocerus maculipennis*, Thos., 1876. Bul. I, Ill. Mus. Nat. Hist., 61.

*Gomphocerus maculipennis*, Bruner, 1877. Can. Ent., IX, 144.

In part, *Gomphocerus maculipennis*, Thos., 1880. Rept. Nox. and Ben. Ins. Ill., 102.

In part, *Gomphocerus maculipennis*, Fernald, 1887. Orth. N. Eng., 37, fig. 7.

*Gomphocerus maculipennis*, Bruner, 1884. 3rd Rept. U. S. Ent. Com., 55.

*Gomphocerus maculipennis*, Schufeldt, 1884. Proc. U. S. Nat. Mus., VII, 332 and 335.

*Gomphocerus maculipennis*, J. B. Smith, 1884. Bul. 4, Div. Ent., 30.

*Gomphocerus maculipennis*, Bruner, 1885. Rept. Com. Agr., 307.

*Stenobothrus maculipennis*, Lintner, 1885. 2nd Rept. Ins. N. Y., 196.

*Stenobothrus maculipennis*, Bruner, 1885. Bul. Wash. Col. Lab. Nat. Hist., Vol. I, No. 4, 131.

*Stenobothrus maculipennis*, Davis, 1889. Ent. Am., V, 81.

*Stenobothrus maculipennis*, J. B. Smith, 1892. Bul. 90, N. J. Agr. Col. Ex. Sta., 31, pl. i, fig. 19.

*Stenobothrus maculipennis*, Morse, 1893. Psyche, VI, 479, fig. 4.

*Stenobothrus maculipennis*, Morse, 1894. Psyche, VII, 14 and 104.

*Stenobothrus maculipennis*, Garman, 1894. 6th Ann. Rept. Ky. Agr. Ex. Sta., 9.

*Stenobothrus propinquans*, Scud., 1862. Jour. Bost. Soc. Nat. Hist., VII, 461.

*Stenobothrus propinquans*, Walk., 1870. Cat. Derm. Salt., IV, 754.

*Stenobothrus propinquans*, Thos., 1873. Syn. Acrid. N. Am., 90.

*Stenobothrus propinquans*, Bruner, 1877. Can. Ent., IX, 144.

*Stenobothrus propinquans*, Provancher, 1877. Faune Ent. du Can., 43.

*Stenobothrus propinquans*, Scud., 1880. Second Rept. U. S. Ent. Com., 25.

*Stenobothrus*, sp., Uhler, 1877. Bul. U. S. Geol. and Geog. Surv. Terr., I, 792.

*Orphula maculipennis*, Bolivar, 1888. Ex. Mem. Soc. Zool. Fr., 27.

*Orphula maculipennis*, Morse, 1896. Psyche, VII, fig. 8-8 e.

Not *Stenobothrus maculipennis*, McNeill, 1891. Psyche, 65.

**Hab.** United States east of the Rocky Mountains. It is possible that the range of this species is greater than I have given it, but there has been so much uncertainty about the identity of this and allied species that it is impossible to know in all cases to what species the reference was made. I am inclined to think that the species generally referred to *propinquans* was generally a long-winged *aqualis* as the range of this species is much farther north than *maculipennis* which is a southern form. I think there is little doubt but that the synonymy given above is correct. Mr. Scudder compared his *propinquans* with Burmeister's type of *pelidna* and decided that the former was a synonym. I have a typical specimen of *propinquans* from Mr. Scudder's cabinet which he has labeled as equal to *pelidna*. A careful study of this specimen has convinced me that it is *maculipennis* and really much more typical than some of the southern forms. Furthermore, Scudder's description of *propinquans* applies about equally well to varieties of *maculipennis* and *aqualis* except in one particular. He says "Hind tibiæ plumbeus with a broad pale annulation at the base." This applies to most varieties of *maculipennis*, but I have never seen a specimen of *aqualis* in the hundreds I have in my collection which contains specimens from Iowa, Illinois, Missouri, Arkansas, Louisiana, Texas, Indiana, New York, Massachusetts, Connecticut, New Hamp-

shire, New Jersey, Maryland, Georgia, or in any collection to which I have had access, which had this mark.

2. ORPHULA OLIVACEA, Morse. Fig. 17 b.

*Stenobothrus olivaceus*, Morse, 1893. Psyche, VI, 479, fig. 182.

*Stenobothrus olivaceus*, Morse, 1894. Psyche, VII, 105.

*Stenobothrus olivaceus*, Morse, 1896. Psyche, VII, 327, fig. 10-10a.

**Hab.** Greenwich and Stanford, Connecticut, salt marshes (Morse).

3. ORPHULA DECORA, n. sp. Fig. 17 d.

Length (female).....	24	mm.
Tegmina.....	16	mm.
Head.....	3	mm.
Pronotum.....	4½	mm

Vertex broad but little advanced in front of the eyes, with a very low lateral carina, close to which is a shallow narrow sulcus and no median carina. The frontal costa is not at all sulcate, with the sides straight and very moderately divergent. The lateral foveolæ are elongate triangular and obscure. The face is arcuate. The antennæ are filiform, scarcely at all depressed. The pronotum has the median carina cut distinctly behind the middle. The lateral carinæ are nearly straight and parallel to the median carina, being quite parallel to the second sulcus and from that point barely divergent to the posterior margin of the metazone which is moderately angulate. The lobes of the mesosternum are separated by a space much broader than long. The lobes of the metasternum by a space much longer than broad. The tegmina are a little longer than the abdomen. The general color is testaceous, with the sides of the abdomen and an obscure stripe behind the eye a little darker, and the whole upper surface, including the anal and the costal fields of the tegmina green. The testaceous discoidal field is scarcely perceptibly maculate with very small spots.

Described from a single female which has lost its posterior femora and all of one and part of the other antenna.

This species is more closely related to *speciosa* than to any other of the Orphulæ. It is, however, readily distinguished by its much greater size approaching as it does very nearly *Dichromorpha viridis*, the female being a little less robust than in that species. It is also distinct in the structure of the pronotum in which the lateral carinæ are very nearly parallel and straight. The vertex is shorter and more rounded than in *speciosa* and there is no median carina. The metas-

ternal lobes are separated by a space about twice as long as broad in this species, in *speciosa* by a space about as long as broad. In some respects *decora* approaches *O. orizabæ*, but it is readily distinguished from that species by the very much shorter vertex and the parallel lateral carinæ of the pronotum.

**Hab.** Fayetteville, Arkansas.

4. ORPHULA SPECIOSA, Scud. Fig. 17 c.

Length (male) . . . . .	14-15 mm.	(female) . . . . .	20-21 mm.
Tegmina . . . . .	12-13 mm.	. . . . .	12-16 mm.
Antennæ . . . . .	5-6 mm.	. . . . .	6 mm.
Post. Fem . . . . .	9 mm.	. . . . .	11 mm.

Scutellum of the vertex extending in front of the eyes much less than the distance between the eyes, with the sides meeting at an angle scarcely so little as a right angle even in the male. A somewhat crescent-shaped sulcus extends across the scutellum and this is interrupted by a faint median carina which extends backward more or less distinctly to the middle of the occiput. The lateral foveolæ are usually indistinct and triangular. The frontal costa has the sides slightly and somewhat regularly diverging from the vertex to the clypeus; it is furnished with coarse lateral walls which are moderately high or scarcely elevated. The eyes are distinctly less than twice as long as the groove below the eye. The antennæ are about as long as the head and pronotum; they are plainly depressed with the segments near the middle from one and one-half to twice as long as broad. The three carinæ of the pronotum are distinct raised lines, cut slightly behind the middle by the principal sulcus. The lateral carinæ are gently sinuate and convergent to the second sulcus on the prozone and only slightly divergent on the metazone.

The tegmina are rarely longer than the abdomen in the female and they very rarely surpass the knees in the male. The ulnar area is usually twice as wide as the intercalary area in the middle of the elytra and is furnished with one (male) or two (female) rows of cells. The intercalary area has but a single row of cells at the distal end.

The color is extremely variable. Some specimens are a nearly uniform dark brown; lighter colored specimens have the ground color any shade of brown or green, sometimes varied with rose, with a rather broad fuscous stripe extending from the eye across the upper margin of the lateral lobes of the pronotum, on the metazone crossing the lateral carinæ and edging the disk. In many specimens the lateral carinæ

are outlined with a lighter color. The elytra may be (*a*) nearly uniform brown; (*b*) nearly uniform green, except the radial field, which is more or less completely brown or fuscous with a single row of darker spots extending through the discoidal area to or beyond the middle of the tegmina; (*c*) the anal field concolorous with the occiput and disk of the pronotum, and the costal field green or some shade of brown different from that of the anal field.

The posterior femora are greenish or brown, with the outer face more or less infuscated but never plainly banded.

The posterior tibiæ are dull brown, yellowish without any pale annulation near the base.

This is a common or abundant species from the Yellowstone Valley to Maine. In Northern Illinois it is confined to the tops and sides of the hills. In suitable situations (somewhat dry pasture lands) it is not uncommon as far south as Kansas and North-west Arkansas, and I have found it common on the hills about Shreveport, La.

I have examined Mr. Scudder's type of *S. speciosus* and *S. gracilis* and I think there is no doubt of their specific identity with *S. æqualis*. I have also a specimen of *S. bilineatus* (Scud.) from Dr. Scudder's cabinet, and I think there is no reasonable doubt of its identity with the above-named species.

*Stenobothrus speciosus*, Scud., 1862. Jour. Bost. Soc. Nat. Hist., VII, 458.

*Stenobothrus speciosus*, Walk., 1870. Cat. Derm. Salt., IV, 754.

*Stenobothrus speciosus*, Thos., 1873. Syn. Acrid. N. Am., 86.

*Stenobothrus speciosus*, Bruner, 1883. 3rd Rept. U. S. Ent. Com., 55.

*Stenobothrus æqualis*, Scud., 1862. Jour. Bost. Soc. Nat. Hist., VII, 459.

*Stenobothrus æqualis*, S. I. Smith, 1868. Proc. Port. Soc. Nat. Hist., I, 148.

*Stenobothrus æqualis*, Walk., 1860. Cat. Derm. Salt., IV, 754.

*Stenobothrus æqualis*, Scud., 1874. Fin. Rept. Geol. N. H., 373.

*Stenobothrus æqualis*, Bruner, 1877. Can. Ent., IX, 144.

*Stenobothrus æqualis*, Bruner. 3rd Rept. Ent. Com., 55.

*Stenobothrus æqualis*, Lintner, 1885. 2nd Rept. Ins. N. Y., 196.

*Stenobothrus æqualis*, Bruner, 1885. Bul. Wash. Col. Lab. Nat. Hist., 131, Vol. I, No. 4.

*Stenobothrus æqualis*, Bruner, 1885. Rept. Com. Agr., 307.

*Stenobothrus æqualis*, Bruner, 1887. Rept. Com. Agr., 167.

*Stenobothrus æqualis*, J. B. Smith, 1892. Bul. 90, N. J. Agr. Col. Ex. Sta., 31.

*Stenobothrus æqualis*, Osborn, 1892. Proc. Iowa Acad. Sci. 1890-91, 4.

*Stenobothrus æqualis*, Morse, 1893. Psyche, VI, 476, figs. 5 and 6.

*Stenobothrus æqualis*, Morse, 1894. Psyche, VII, 14 and 104.

*Stenobothrus bilineatus*, Scud., 1862. Jour. Bost. Soc. Nat. Hist., VII, 460.

*Stenobothrus bilineatus*, S. I. Smith, 1868. Proc. Port. Soc. Nat. Hist., I, 148.

*Stenobothrus bilineatus*, Walk., 1870. Cat. Derm. Salt., IV, 754.

*Stenobothrus bilineatus*, Thos., 1873. Syn. Acrid. N. Am., 90.

*Stenobothrus bilineatus*, Bruner, 1883. 3rd Rept. U.S. Ent. Com., 55.

*Stenobothrus bilineatus*, Morse, 1894. Psyche, VII, 104.

*Stenobothrus gracilis*, Scud., 1872. Fin. Rept. U.S. Geol. Surv. Neb., 250.

*Stenobothrus gracilis*, Thos., 1872. Pelim. Rept. U. S. Geol. Surv. Mont., 430.

*Stenobothrus gracilis*, Thos., 1873. Syn. Acrid. N. Am., 94.

*Stenobothrus gracilis*, Bruner, 1877. Can. Ent., IX, 144.

*Stenobothrus gracilis*, Bruner, 1883. 3rd Rept. U. S. Ent. Com., 55.

*Stenobothrus gracilis*, Bruner, 1885. Rept. Com. Agr., 307.

*Stenobothrus maculipennis*, S. I. Smith, 1868. Proc. Port. Soc. Nat. Hist., I, 148.

*Stenobothrus maculipennis*, Thos., 1876. Bul. I, Ill. Mus. Nat. Hist., 61.

*Stenobothrus maculipennis*, McNeill, 1891. Psyche, VI, 65.

*Orphula æqualis*, Bolivar, 1888. Ex. Mem. Soc. Zool. France, 27.

*Orphula æqualis*, Morse, 1896. Psyche, VII, 326, figs. 9, 9c.

5. ORPHULA TEPANICA (?), Sauss. Fig. 17 a.

Length (male) . . . . . 16 mm. (female) . . . . . 20 mm.

Tegminæ . . . . . 12 mm. . . . . 14 mm.

Antennæ . . . . . 5 mm. . . . . 5 mm.

Post. Fem. . . . . 9 mm. . . . . 12 mm.

Vertex with a distinct but shallow crescent-shaped foveola with the lateral carinæ sharp and elevated and meeting in a nearly sharp angle equal to (female) or less than (male) a right angle. Lateral foveolæ nearly linear and distinct. Frontal costa very slightly (female) or moderately (male) sulcate with the sides regularly divergent below.



The antennæ are much (female) or little (male) shorter than the head and pronotum and they are acuminate at the tip. Pronotum much longer than the head with the median carina cut decidedly behind the middle, and the lateral carinæ slightly convergent to the second sulcus, more strongly divergent from that point to the posterior margin which is very obtusely angulate. The tegmina are about as long as (female) or a little longer than (male) the abdomen. The ulnar area of the tegmina is much narrower than in *speciosa*, and is occupied by very weak cross-veins. The color is greenish or testaceous, very similar to light colored specimens of *speciosa*.

This species is described from one male and four females from Siskiyou county and Los Angeles, California. They were collected by Mr. Coquillett and are now in the National Museum. It is impossible to be certain that the species just described is that named *tepanicus* by Saussure, as he gives a very imperfect description of the pronotum. As his description fits these specimens very well as far as it goes, and as the locality is not far removed, I have thought it best not to risk another synonym.

? *Stenobothrus tepanicus*, Sauss., 1861. Orth. Nov. Am., Ser. II, 21.

? *Stenobothrus tepanicus*, Thos., 1873. Syn. Acrid. N. Am., 206.

**Hab.** Mexico (Saussure); Los Angeles, Siskiyou county, California.

6. ORPHULA ORIZABÆ, n. sp. Fig. 17.

Length (male).....	13.5-14.5 mm.	(female).....	21 mm.
Tegmina .....	11-12.5 mm.	.....	14 mm.
Antennæ .....	5 mm.		
Post. Fem. ....	9 mm.	.....	11 mm.

The vertex is much produced in front of the eyes, being about as long as wide. It is very shallowly but broadly sulcate with the lateral carinæ very slight and scarcely elevated. The lateral foveolæ are triangular and obscure. The frontal costa is narrow and scarcely sulcate. The face is very slightly arcuate. The antennæ are very short, not equaling the head and pronotum even in the male. The pronotum is much longer than the head. The median carina is cut in the middle by the principal sulcus. The lateral carinæ are quite as distinct and sharp as the median, and they are divergent from almost the anterior margin to the posterior margin, which is strongly angulate. The tegmina exceed (male) or fall a little short (female) of the posterior femora. In some females the discoidal area has the distal portion a

little irregularly reticulate instead of the single series of cells usual in the division of the genus to which this species belongs. In the female, the ulnar area of the tegmina is less than twice as broad as the discoidal area and is occupied by a single series of weak and widely separated veins. The general color of the female is green with the under parts, the sides of the abdomen, and the inner and lower faces of the posterior femora and the posterior tibiæ brown; with the lateral carinæ of the pronotum whitish, accompanied by a very narrow black line, external on the prozone, internal on the metazone. The tegmina are grass-green and quite immaculate. The male is wholly testaceous, varying to dark brown except the upper surface of the head, the disk of the pronotum, and the anal field of the tegmina. The discoidal field is obsoletely maculate, with a few irregularly scattered small spots.

Described from two females from Mexico City, Mexico, and San Antonio, Texas, and four females from Mexico City and Tlalpam, Mexico. All of these specimens are in my collection except the specimen from San Antonio which is in the National Museum. The last mentioned specimen differs a little from the other male, especially in having the frontal costa plainly sulcate with heavy lateral carinæ and the ulnar area of the tegmina has more numerous cross-veins. I think, however, that it belongs to the species here described.

**Hab.** Mexico City, Tlalpam, Mexico, San Antonio, Texas.

7. ORPHULA SCUDDERI, Bolivar.

*Orphula scudderi*, Bol., 1888. Ex. Mem. Soc. Zool. France, 27.

**Hab.** Cuba (Bolivar).

8. ORPHULA PUNCTATA, De Geer.

*Acridium punctatum*, De Geer, 1773. Mem. Ins., III, 503, pl. XLII, fig. 12.

*Truxalis (orphula) punctata*, Stål, 1873. Recen. Orth., I, 106.

*Orphula punctata*, Brunner, 1893. Proc. Zool. Soc., Lond., XLI, 606.

**Hab.** Surinam (De Geer); Rio Janeiro, Columbia (Stål), Grenada, St. Vincent, and other islands of the West Indies (Brunner).

I am unacquainted with this species and the descriptions are too meagre to determine its position, but I include it here for the sake of completeness.

## SPECIES OF UNCERTAIN VALUE AND POSITION:

*Stenobothrus mexicanus*, Walk., 1870. Cat. Derm. Salt., IV, 756 (Oajaca).

*Stenobothrus decisus*, Walk., 1870. Cat. Derm. Salt., IV, 757 (San Domingo).

*Stenobothrus arctatus*, Walk., 1870. Cat. Derm. Salt., IV, 761 (Honduras).

*Stenobothrus viridissimus*, Walk., 1870. Cat. Derm. Salt., IV, 761 (Honduras).

These species apparently belong to *Orphula*, but the descriptions are not good enough to enable one to certainly recognize such variable and closely-allied forms. It is not unlikely that *mexicanus arctatus*, and *viridissimus* are synonyms of *O. tepanicus*, Sauss., while *decisus* is possibly *O. speciosus*.

## XVIII. ALPHA, Brunner. Fig. 18.

Head about as long as the pronotum. Vertex almost horizontal, slightly declivent, sulcate with rather heavy lateral carinæ which meet in a blunt point and with no trace of a median carina. The lateral foveolæ are present but often not clearly separated from the front on account of the obsolescence of the lower carinæ. The frontal costa is narrow above the ocellus, sulcate and slightly acuminate below; its sides are more or less strongly divergent, while its lateral carinæ are heavy and distinct. The face seen from the side is strongly oblique and straight. The antennæ are somewhat (female) or much (male) longer than the head and pronotum. They are flattened basally and plainly acuminate. The disk of the pronotum is somewhat convex, with the median carina rather slight and cut by the distinct principal sulcus behind the middle. The lateral carinæ are scarcely distinguishable, even on the metazone, but they are replaced on the sides of the disk by distinct light-colored stripes which are strongly or very strongly sinuate, and divergent on the metazone. The metazone has its posterior margin gently rounded. The lateral lobes of the pronotum are small, a little longer than high, with the anterior margin moderately oblique, the posterior sub-perpendicular and the lower nearly straight and horizontal. The lobes of the mesosternum are separated by a space much broader than long, and the metasternal lobes by a space about square (female) or longer than broad (male). The tegmina and

wings are well developed. The former has the mediastine vein very short in the male, with the scapular area expanded so as to make the anterior margin of the tegmina plainly arcuate near the middle. The discoidal and ulnar areas are imperfectly or not at all closed. The posterior femora are slender, with more or less distinct bands on the upper face. The posterior tibiæ have the apical spines on the inner side much stronger than those on the outside. The valves of the ovipositor are strongly exerted, the lower ones being furnished with an unusually strong lateral tooth.

Of the new genera given by Brunner in his *Révision du système des Orthoptères*, this is one of the few that can be clearly determined. He says in a foot-note that it is represented by four species in the United States; with *Stenobothrus occipitalis*, Thos., as the type. In other cases he simply states that the genus is founded upon one or more species from a certain locality without either naming or describing the species and with no description of the genus other than the very brief one given in the key. It is impossible to determine from these brief characterizations just what the genus is and to guess at these would only make confusion in synonymy so that I have determined to treat such genera as though they never had been made. I know of but three species in the United States or North America that will be included in this genus as I have limited it.

*Alpha*, Brunner, 1893. Rev. Sys. Orth., 121.

In part, *Stenobothrus*, Thos. Syn. Acrid., N. Am., 81.

*Ochrilidea*? Bruner, 1889. Proc. U. S. Nat. Mus., XII, 52.

#### KEY TO ALPHA, Bruner.

- A.<sup>1</sup> Median carina of the pronotum cut much behind the middle.  
Lateral carinæ twice as widely separated at the posterior margin of the metazone as near the middle of the disk.
- B.<sup>1</sup> Posterior tibiæ red. . . . . 1.— *Occipitalis*, Thos.
- B.<sup>2</sup> Posterior tibiæ testaceous. . . . . 2.— *Cinerea*, Bruner.
- A.<sup>2</sup> Median carina of the pronotum cut very little behind the middle.  
Lateral carinæ about twice as widely separated at the posterior margin of the metazone as at the middle of the disk. . . . .  
. . . . . 3.— *Crenulata*, Bruner.

1. ALPHA OCCIPITALIS, Thos. Figs. 18a, 18b.

*Stenobothrus occipitalis*, Thos., 1873. Syn. Acrid. N. Am., 81.

*Stenobothrus occipitalis*, Bruner, 1883. 3rd Rept. U. S. Ent. Com., 55.

*Stenobothrus occipitalis*, Bruner, 1884. Bul. 4 Div. Ent., 58.

*Oxycoryphus occipitalis*, Thos., 1876. Proc. Dav. Acad. Nat. Sci.,  
I, 251.

*Orchrilidea occipitalis*, Bruner, 1889. Pro. U. S. Nat. Mus., XII, 52.

*Orchrilidea occipitalis*, Townsend, 1893. Insect Life, VI, 31.

*Orchrilidea occidentalis*, Bruner, 1893. XII, Proc. U. S. Nat.  
Mus., 51.

*Stenobothrus occidentalis*, Bruner, 1893. XII, Proc. U. S. Nat.  
Mus., 51.

**Hab.** Both slopes of the Rocky Mountains, extending from New Mexico and Arizona to Idaho and Montana and as far east as western Nebraska and Dakota. According to Bruner this and the following species are "frequenters of the mountain slopes and foot-hills and especially so when these localities are somewhat sandy. Like *crenulata* they are partial to the bare surfaces, and are very active in their movements." The National Museum contains what appears to be Thomas' type as well as other specimens from Colorado, Wyoming, Montana, and Nebraska.

2. ALPHA CINEREA, Bruner.

*Orchrilidea cinerea*, Bruner. Proc. U. S. Nat. Mus., XII, 51.

**Hab.** Wyoming, Idaho, Western Dakota, and Nebraska.

3. ALPHA CRENULATA, Bruner.

*Orchrilidea crenulata*, Bruner. Proc. U. S. Nat. Mus., XII, 51.

**Hab.** Both slopes of the Rocky Mountains, from the southern to the northern boundaries of the United States, as far east as western Dakota and Nebraska.

XIX. **PHLIBOSTROMA**, Scud. Fig. 19.

Body robust, with the head unusually large. The occiput is strongly convex. The vertex convex, declivent, and not sulcate, advanced in front of the eyes only half as far as the distance between them, with distinct lateral carinæ which are nearly straight and meet in a rounded angle. There is sometimes a trace of a median carina. The lateral foveolæ are scarcely separated from the front by a carina which is always weak, sometimes wanting. The frontal costa is nearly plain or sulcate with heavy lateral carinæ which are very moderately divergent downward. The face is gently arcuate and very moderately oblique. The antennæ are filiform, longer (female) or considerably longer (male)

than the head and pronotum. The pronotum has the disk nearly plain, with all the carinae, but especially the median, distinct. This is cut by the transverse sulcus very little behind the middle. The lateral carinae are very strongly sinuate and upon the metazone divergent. They are cut plainly by the principal sulcus. The metazone has its posterior margin roundly angulate. The lateral lobes of the pronotum are higher than long with the anterior margin slightly oblique, the posterior perpendicular and the lower arcuate. The anterior corner of the lateral lobes is evenly rounded, the posterior angulate with a rounded apex. There is on the anterior part of the lateral lobes a heavy carina which extends from the middle sulcus forward and a little downward to near the middle of the anterior margin. The mesosternal lobes are separated by a narrow space several times as broad as long, and the metasternal lobes by a narrow space not more than twice (male) or three or four times (female) as long as broad. The tegmina are a little shorter (female) or a little longer (male) than the abdomen. They have the scapular area much expanded in the male so as to make the anterior margin strongly arcuate. The discoidal and ulnar areas are frequently imperfectly closed, and the former has an irregular intercalary vein. The posterior femora are banded above and on the outer face. The posterior tibiae are reddish with the apical spurs on the inner side not very unequal in length. The valves of the ovipositor are very moderately exerted.

*Phlibostroma*, Scud., 1875. Cent. Orth., 28.

In part, *Stenobothrus*, Thos., 1873. Syn. N. Am. Acrid., 93.

*Beta*, Brunner, 1893. Rev. Sys. Orth., 121.

The genus is represented by a single variable species.

1. *PHLIBOSTROMA QUADRIMACULATA*, Thos. Figs. 19a, 19b.

*Stenobothrus quadrimaculatus*, Thos., 1871. Prelim. Rept. U. S. Geol. Surv. Wyo., 280.

*Stenobothrus quadrimaculatus*, Thos., 1872. Prelim. Rept. U. S. Geol. Surv. Mont., 430.

*Stenobothrus quadrimaculatus*, Thos., 1873. Syn. N. Am. Acrid., 93.

*Stenobothrus quadrimaculatus*, Bruner, 1883. 3rd Rept. U. S. Ent. Com., 56.

*Stenobothrus quadrimaculatus*, Bruner, 1885. Rept. Com. Agr., 1885, 307.

*Phlibostroma quadrimaculata*, Bruner, 1885. Bul. Wash. Col. Lab. Nat. Hist., I, No. 4, 135.

*Phlibostroma picta*, Scud., 1875. Cent. Orth., 29.

*Phlibostroma picta*, Bruner, 1883. 3rd Rept. U. S. Ent. Com., 57.

*Phlibostroma picta*, Bruner, 1885. Bul. Wash. Col. Lab. Nat. Hist., No. 7, 199.

*Phlibostroma parva*, Scud., 1876. U. S. Geol. Surv. W. 100 Mer., App. JJ, 510.

*Phlibostroma parva*, Bruner, 1883. 3rd Rept. U. S. Ent. Com., 57.

*Phlibostroma parva*, Bruner, 1885. Rept. Com. Agr., 307.

*Phlibostroma parva*, Bruner, 1885. Bul. Wash. Col. Lab. Nat. Hist., No. 7, 199.

*Stenobothrus lactus*, Uhler, 1877. Bul. U. S. Geol. and Geog. Surv. Terr., III, 792.

Not *Phlibostroma parva*, McNeill. Psyche, VI, 64.

**Hab.** The eastern slopes of the Rocky Mountains from Texas to British America and eastward to Kansas and Nebraska.

The study of a considerable number of specimens from numerous localities and an examination of Scudder's type of *Phli. pictum* and of what appears to be Thomas' types of *St. quadrimaculatus* in the National Museum has led me to the conclusion that there is but a single variable species of this genus in the United States. The United States National Museum contains specimens from Colorado, Nebraska, Wyoming, British America, and Texas.

## XX. BOÖPEDON, Thos. Fig. 20.

Vertex declivent, convex and not separated from the front by distinct carinæ and not forming an angle with the front, but united with it in a curve. The foveolæ of the vertex and of the tempora are indicated by punctures or sometimes by very shallow sulcations. The latter are dorsal. The front is nearly perpendicular. The frontal costa is very broad, about equal to half the width of the vertex between the eyes, convex with the sides very little parallel, only a little constricted at the vertex, vanishing before reaching the clypeus. The antennæ are filiform, much (male) or somewhat (female) longer than the head and pronotum. The disk of the pronotum is more or less elevated toward the median carina. This is unusually prominent and is cut near the middle by the principal sulcus only. The lateral carinæ are nearly parallel or very moderately sinuate and on the metazone divergent. They are most distinct on the anterior margin of the prozone, obsolete on the metazone. The posterior margin of the

metazone is obtusely but sharply angulate. The lateral lobes of the pronotum are higher than long with the anterior and posterior margins straight, decidedly and equally oblique, and with the lower margin strongly arcuate and somewhat angulate in the middle. The lobes of the mesosternum are separated by a space much wider than long, the metasternal lobes by a linear ridge with an elongate deep pit on either side. The wings and tegmina are well developed but do not exceed the abdomen. The former in the male have the scapular area considerably expanded and filled with strong oblique cross-veins. The discoidal area is filled with irregularly reticulating veins. The posterior femora are banded on the inner and outer surfaces. The posterior tibiæ have the apical spurs on the inner side very long and stout, being twice as long as those on the outer side, and the anterior one of the inner spurs is nearly twice as long as the other. The valves of the ovipositor are only moderately exerted.

This genus is North American and is represented by two species only, both western forms.

*Boöpedon*, Thos., 1870. Proc. Acad. Nat. Sci. Phila., 83.

*Boöpedon*, Thos., 1871. Prelim. Rept. U. S. Geol. Surv. Wyo., 272.

*Boöpedon*, Thos., 1873. Syn. Acrid. N. Am., 140.

*Boöpedon*, Brunner, 1893. Rev. Sys. Orth., 123.

#### KEY TO BOÖPEDON, THOS.

- A.<sup>1</sup> Elytra brown, plain or most obscurely spotted. General color varying from shining black to yellow, posterior femora stout and more than commonly expanded at the base with black bands extending across the outer, upper and inner faces. . . . . 1.—*Nubilum*, Say.
- A.<sup>2</sup> Elytra brown with a yellow stripe near both the anterior and posterior edges and three oblong yellow spots in the discoidal field. General color greenish-yellow varied with brown. Posterior femora slender with a longitudinal fuscous stripe on the outer, and fuscous bands or markings on the inner but not on the upper face . . . . . 2.—*Flavofasciatum*, Thos.

#### 1. BOÖPEDON NUBILUM, Say. Figs. 20a, 20b.

*Gryllus nubilus*, Say, 1825. Jour. Acad. Nat. Sci. Phila., IV, 308.

*Gryllus nubilus*, Say, 1825. Ent. N. Am. Ed. Lec., II, 237.

*Boöpedon nubilum*, Thos., 1871. Prelim. Rept. U. S. Geol. Surv. Wyo., 265 and 272.



*Boöpedon nubilum*, Thos., 1872. Prelim. Rept. U. S. Geol. Surv. Mont., 430.

*Boöpedon nubilum*, Thos., 1873. Syn. Acrid. N. Am., 141, pl. fig. 11.

*Boöpedon nubilum*, Bruner, 1877. Can. Ent., IX, 144.

*Boöpedon nubilum*, Bruner, 1885. Rept. Com. Agr., 303.

*Boöpedon nubilum*, Bruner, 1883. 3rd Rept. U. S. Ent. Com., 58.

*Boöpedon nubilum*, Bruner, 1885. Bul. Wash. Col. Lab. Nat. Hist., I, No. 4, 135.

*Boöpedon nubilum*, Bruner, 1885. Bul. Wash. Col. Lab. Nat. Hist., I, No. 7, 198.

*Boöpedon nigrum*, Thos., 1870. Proc. Acad. Nat. Sci. Phila., 83.

**Hab.** Eastern slopes of the Rocky Mountains, extending to eastern Nebraska, Kansas, and Texas.

The National Museum contains Thomas' type of *B. nigrum*.

2. *BOÖPEDON FLAVOFASCIATUM*, Thos.

*Boöpedon flavofasciatum*, Thos., 1870. Proc. Acad. Nat. Sci. Phila., 84.

*Boöpedon flavofasciatum*, Thos., 1871. Prelim. Rept. U. S. Geol. Surv. Wyo., 265 and 273.

*Boöpedon flavofasciatum*, Thos., 1873. Prelim. Rept. U. S. Geol. Surv. Mont., 430.

*Boöpedon flavofasciatum*, Thos., 1873. Syn. Acrid. N. Am., 141.

*Boöpedon flavofasciatum*, Bruner, 1877. Can. Ent., IX, 144.

*Boöpedon flavofasciatum*, Bruner, 1883. 3rd Rept. U. S. Ent. Com., 58.

**Hab.** Montana, Wyoming, Colorado, Nebraska, New Mexico, Texas, and eastern slopes of the Rocky Mountains.

The National Museum contains Thomas' types, two females. It also contains a male from Dallas, Texas, which also probably belongs to this species. In this specimen the tegmina are less than half as long as the abdomen and rounded at the tip. The femora are decidedly longer than in *B. nubilum*, and the lateral carinæ of the pronotum are more distinct and the disk is less rounded.

XXI. *PLECTROPHORUS*, n. gen. Fig. 21.

Head much shorter than the pronotum. Vertex horizontal, sulcate, with slight lateral and obsolete median carina, but little advanced in front of the eyes. (The frontal costa is indistinctly separated from the vertex and it is unusually prominent, seen from above, and

much advanced.) The top of the head is furnished with three slight carinæ. The lateral foveolæ are scarcely discernible as a group of punctations, but the tempora are plainly visible from above. The frontal costa is prominent, not at all sulcate but plainly convex, broad, with the sides sub-parallel. The face seen from the side is strongly arcuate and moderately declivent. The antennæ are sub-filiform, as long as the head and pronotum. The pronotum has the disk slightly elevated toward the median carina, which is very distinct and is cut once plainly in front of the middle. The lateral carinæ are distinct, except between the first and third sulci where they are broken and interrupted. They are gently arcuate and convergent to the second sulcus, beyond which they are slightly arcuate and strongly divergent. The metazone is strongly angulate. The lateral lobes of the pronotum are much higher than long, with the anterior and posterior margins straight and very little inclined and the lower margin horizontal behind, ascending before the middle. The mesosternal lobes are separated by a space about as long as broad. The metasternal lobes are nearly (female) or quite (male) contiguous behind and inclose two deep pits. The tegmina and wings are very large. The former has the discoidal area densely and irregularly reticulate. The posterior femora are unusually heavy at the base, with the apical half slender. The posterior tibiæ have the apical spurs on the inner side very large, the anterior one being straight, twice as long as the one behind it and scarcely shorter than the first tarsal joint. The valves of the ovipositor are moderately exerted. The disk of the pronotum is velvety black with a broad median longitudinal light stripe, and the tegmina are distinctly maculate with large spots, as in *Hippiscus*.

The genus is tropical American. It includes two species. The type is *Stenobothrus viatorius*, Sauss. This species, with *Scyllina peragrans*, Stål, from South America was made by Stål the type of the genus *Scyllina*. But it is generically distinct from *S. peragrans*, and does not fall into *Scyllina* as it is given in his key. I have therefore separated it.

In part, *Scyllina*, Stål, 1873. Recen. Orth, I, 94.

#### KEY TO PLECTROPHORUS, n. gen.

- A.<sup>1</sup> Foveolæ of the vertex semi-elliptical. Posterior femora orange, with the apex blue..... 1.—*Viatorius*, Sauss.  
 A.<sup>2</sup> Foveolæ of the vertex triangular. Posterior femora red, with the apex blue..... 2.—*Gregarius*, Sauss.

## 1. PLECTROPHORUS VIATORIVS, Sauss. Figs. 21a, 21b, 21c.

*Stenobothrus viatorius*, Sauss., 1861. Orth. Nov. Am., II, 20.

*Stenobothrus viatorius*, Thos., 1873. Syn. Acrid. N. Am., 206.

*Scyllina viatoria*, Stål, 1873. Recen. Orth., I, 112.

**Hab.** All of Mexico, where it is common and injurious (Sauss.). I have specimens from Orizaba and Tlalpam.

## 2. PLECTROPHORUS GREGARIUS, Sauss.

*Stenobothrus gregarius*, Sauss., 1861. Orth. Nov. Am., II, 20.

*Stenobothrus gregarius*, Thos., 1873. Syn. Acrid. N. Am., 206.

**Hab.** Islands of St. Thomas and Hayti (Sauss.).

I am unacquainted with the species, but it probably belongs to this genus.

## XXII. MECOSTETHUS, Fieb. Fig. 22.

Vertex horizontally produced with a median carina more or less distinct and with lateral carinæ distinct, straight, meeting in a sharp or rounded point in front to form an angle a little greater or a little less than 90 degrees. The lateral foveolæ are very small, triangular, basal (distant from the vertex) visible from above, sometimes almost obsolete. The frontal costa is continued distinctly almost to the clypeus, it is sulcate at least below the ocellus. The antennæ are filiform, much longer (male) or about as long (female) as the head and pronotum together. The pronotum is plain above with all the carinæ distinct, the median cut in or a little in advance of the middle, the lateral cut by the principal sulcus only or by either or both of the other sulci as well. The metazone is very obtusely angled. The lateral lobes of the pronotum are at least as high as long with the anterior and posterior margins sub-perpendicular, and with the lower margins only moderately obtuse and but little rounded at the apex. The tegmina are well developed in both sexes, the mediastine vein is well developed, extending beyond the middle and the costal field is expanded at the base and furnished with an adventitious vein. The scapular area is but little expanded in the male and is about equal in both sexes. The discoidal area is furnished with a very prominent intercalary vein which is nearer the ulnar than the radial vein. This area is occupied by a double series of strong cross-veins and forms the musical organ in the male. The posterior femora are somewhat longer than usual, extending beyond the end of the abdomen in the male. The last

ventral plate of the male is acutely produced, being at least twice as long as its greatest depth. The valves of the ovipositor are strongly exerted, with the upper pair finely crenulate above.

*Mecostethus*, Fieber, 1853. Syn., 10.

*Mecostethus*, Bruner, 1882. Pro. Eur. Orth., 94, fig. 24.

*Mecostethus*, Bruner, 1893. Rev. Sys. Orth., 123.

*Mecostethus*, Morse, 1896. Psyche, VII, 327, figs. 13-15b.

*Stetheophyma*, Fisch., 1853. Orth. Eur., 357, XVIII, fig. 3.

*Stetheophyma*, Stål, 1873. Recen. Orth., 1, 93.

*Stetheophyma*, Thos., 1873. Syn. Acrid. N. Am., 98.

*Stetheophyma*, Boliv., 1876. Syn. Acrid. Esp., 139.

*Stetheophyma*, Thos., 1880. Nox. and Ben. Ins. Ill., IX, 84.

This European genus is represented in North America by three species.

#### KEY TO MECOSTETHUS, Fieb.

- A.<sup>1</sup> Prozone shorter than the metazone. Lateral carinæ plainly sinuate and strongly divergent from the first sulcus to the posterior margin. Posterior femora slender.
- B.<sup>1</sup> Scapular area of the tegmina with a pale streak. Intercalary vein of the male with very obscure low dull teeth. . 1.—*Lineatus*, Scud.
- B.<sup>2</sup> Scapular area without a pale streak. Intercalary vein of the male with sharp, elevated, minute, closely-set teeth. . 2 —*Gracilis*, Scud.
- A.<sup>2</sup> Prozone as long as the metazone. Lateral carinæ very nearly straight and very gently divergent. Posterior femora not unusually slender. . . . . 3.—*Platyptera*, Scud.

#### 1. MECOSTETHUS LINEATUS, Scud. Figs. 22a, 22b.

*Arcyptera lineata*, Scud., 1862. Jour. Bost. Soc. Nat. Hist., VII, 462.

*Arcyptera lineata*, Scud., 1874. Fin. Rept. Geol. Surv. N. H., I, 373.

*Arcyptera lineata*, Provancher, 1877. Faune Ent. du Can., 44.

*Arcyptera lineata*, McNeill, 1891. Psyche, VI, 66.

*Stetheophyma lineata*, Thos., 1873. Syn. Acrid. N. Am., 98.

*Stetheophyma lineata*, Thos., 1880. Nox. and Ben. Ins. Ill., 105.

*Stetheophyma lineata*, Fernald, 1887. Orth. N. E., 38.

*Stetheophyma lineata*, Bruner. 3rd Rept. U. S. Ent. Com., 56.

*Stetheophyma lineata*, Morse, 1894. Psyche, VII, 105.

*Mecostethus lineatus*, Morse, 1896. Psyche, VII, 327, figs. 13, 13b.

? *Mecostethus variegatus*, Walk., 1870. Cat. Derm. Salt., IV, 781.

? *Mecostethus variegatus*, Thos., 1873. Syn. Acrid. N. Am., 210.

**Hab.** New England to Northern Illinois and Iowa.

This is a rare species which has been reported but a few times. Walker refers certain specimens from North America to *S. variegatus*, Sulz. It is possible that this determination was correct, but it is very improbable, and I have referred his name to this species with great doubt. It is possible that his specimen is *Boöpedon nigrum*, Thos.

2. MECOSTETHUS GRACILIS, Scud.

*Arcyptera gracilis*, Scud., 1862. Can. Nat., VII, 286.

*Arcyptera gracilis*, Scud., 1862. Jour. Bost. Soc. Nat. Hist., VII, 463.

*Arcyptera gracilis*, S. I. Smith, 1868. Proc. Port. Soc. Nat. Hist., I, 148.

*Arcyptera gracilis*, Scud., 1874. Fin. Rept. Geol. Surv. N. H., I, 373.

*Arcyptera gracilis*, Bruner, 1883. 3rd Rept. U. S. Ent. Com., 56.

*Arcyptera gracilis*, Scud., 1893. 23rd Ann. Rept. Ent. Soc. Ont., 76, fig. 53.

*Arcyptera gracilis*, Morse, 1894. Psyche, VII, 105.

*Mecostethus gracilis*, Morse, 1896. Psyche, VII, 327, fig. 14.

**Hab.** Maine, Red River (British America), Nebraska, and Black Hills (Dakota). The National Museum contains specimens from the last mentioned locality collected by Mr. Bruner.

3. MECOSTETHUS PLATYPTERUS, Scud.

*Arcyptera platyptera*, Scud., 1862. Jour. Bost. Soc. Nat. Hist., VII, 463.

*Stenobothrus platyptera*, Bruner, 1883. 3rd Rept. Ent. Com., 56.

*Stenobothrus platyptera*, Morse, 1894. Psyche, VII, 105.

*Mecostethus platyptera*, Morse, 1896. Psyche, VII, 327, figs. 15, 15b.

**Hab.** New England.

This species has never been reported outside of New England.

XXIII. BOÖTETTIX, Bruner. Fig. 23.

Scutellum of the vertex nearly horizontal, very shallowly sulcate, with a delicate median carina, and slight though distinct raised walls which meet at an acute angle in a very sharp point at the vertex. The tempora are triangular, nearly vertical, and scarcely visible from above, with the lower wall obsolete. The frontal costa is contracted for a short distance below the vertex into a very narrow ridge scarcely wider than the median carina of the pronotum. This rapidly expands until

when opposite the antennæ it is as wide as at any point; from this point it is sub-parallel and sulcate with raised walls. The antennæ are shorter than (female) or about equal to (male) the head and pronotum. They are coarse, somewhat flattened, especially on the apical portion where they are somewhat clavate and more (male) or less (female) acuminate. The eye is rather long, not especially prominent. The occiput is much (male) or little (female) elevated. The pronotum has the disk of the prozone strongly convex, that of the metazone more nearly flat, with its sides rapidly divergent and the posterior margin strongly rounded. The median carina is quite distinct on the metazone, very faint on the prozone except in front of the anterior sulcus. It is cut by all three sulci. The lateral carinæ are entirely obsolete. The lateral lobes of the pronotum are about as long as high, with the anterior and posterior margins sub-perpendicular and both lower angles strongly rounded. The prosternum is furnished with a very low, rounded process. The lobes of the mesosternum and the metasternum are transverse in the female, square in the male. The tegmina are furnished with a distinct (female) or irregular and incomplete (male) intercalary vein, and the plicate is soon united with the dividing vein. The mediastine vein exceeds half the length of the wing in the female, in the male it is much abbreviated and the scapular area is much expanded, hyaline, and filled with a series of strong curved veins. The valves of the ovipositor of the female are exerted, the lower furnished with a large blunt tooth. The posterior femora are slender, equaling (female) or surpassing (male) the abdomen in length.

*Boötettix*, Bruner, 1889. Proc. U. S. Nat. Mus., XII, 58.

This genus contains but one known species.

*BOÖTETTIX ARGENTATUS*, Bruner. Figs. 23a, 23b.

*Boötettix argentatus*, Bruner, 1889. Proc. U. S. Nat. Mus., XII, 59, pl. i, fig. 4 (female), 5 (male).

*Boötettix argentatus*, Townsend, 1892. Can. Ent., XXIV, 198.

*Boötettix argentatus*, Townsend, 1893. Ins. Life, VI, 30.

*Boötettix argentatus*, Scudder, 1893. 23rd Ann. Rept. Ent. Soc. Ont., 76.

This is an arboreal species, said by Mr. Bruner to be found only on an evergreen species of *Ceanothus*. Since reported by Mr. Townsend to be found on *Larrea mexicana*. The latter is an evergreen, and as no evergreen *Ceanothus* is given by either Gray or Coulter it is probable that this species is confined to the single food-plant last mentioned.

XXIV. **LIGUROTETTIX**, n. gen. Fig. 24.

Scutellum of the vertex considerably declined, narrower than the short diameter of the eye, elliptical and sulcate throughout, with the boundary walls high raised lines which are continued backward to a point opposite the middle of the eyes. The lateral foveolæ are visible from above, deeply impressed, and trapezoidal in shape. The frontal costa is not sulcate even at the ocellus. The antennæ are short, filiform, and slender. The eyes are prominent, and the occiput is much (male) or somewhat (female) higher than the disk of the pronotum. The disk of the pronotum is moderately rounded, more decidedly on the prozone. The median carina is slight but distinct, cut near the middle by the last transverse sulcus. The lateral carinæ are wanting, even on the metazone. The lateral lobes of the pronotum are a little higher than long, with the anterior and posterior borders both subperpendicular, and both of the lower angles obtuse and rounded. The prosternum is furnished with a large pyramidal spine. The mesosternal lobes are wider than long in the female; about equally as wide as long in the male. The metasternal lobes are separated by a narrow space in the female, united behind in the male. The tegmina exceed the abdomen in length, the intercalary vein is distinct, and the plicata is soon united with the dividing vein. The mediastine vein is well developed in the female, and extends to a point beyond the middle of the wing. In this sex also the scapular area is filled with a single series of oblique cross-veins, but is not hyaline. In the male the mediastine vein is very much abbreviated and the scapular area greatly expanded so that it occupies one-third of the width of the tegmina and causes the anterior margin of the wing to be much expanded in the second and third fourths. It is hyaline and filled with a series of strong, curved, oblique veins forming a very efficient musical organ. Behind this musical organ the anterior radial vein is greatly thickened. In both sexes the longitudinal veins are distinct, and the cross veins are few and weak comparatively. The wings are more than twice as long as wide, hyaline, with a slight infuscation at the tip, and the veins black. The hind femora are moderately slender with distinct fuscous bands on the upper surface. The valves of the ovipositor of the female are moderately exerted, and the lower pair are furnished with a strong lateral tooth.

This genus is a curious composite form with affinities with *Ædipodinæ* and *Acridinæ*, as well as *Truxalinæ*. It is not closely related to

any other genus of this sub-family with which I am acquainted, but it is nearest *Boëtettix*.

LIGUROTETTIX COQUILLETI, n. sp. Figs. 24a, 24b, 24c.

Length (male).....	14-16 mm.	(female).....	18 mm.
Tegmina.....	14-16 mm.	.....	17 mm.
Antennæ.....	5 mm.	.....	5 mm.
Post. Fem.....	8-9 mm.	.....	9.5 mm.

The scutellum of the vertex is somewhat elliptical in shape, with the posterior end open and the anterior margin somewhat encroached upon in some specimens, especially in the female by the lateral foveolæ. These are about as wide as long with the narrow end forward, the two being separated at the apex by the width of the frontal costa, which is at this point only a little more than half its width between the antennæ where it is very slightly expanded. The antennæ are scarcely equal to the head and pronotum in length. The pronotum has all of the sulci about equally distinct, and the posterior margin of the disk is much rounded rather than angulate. The whole surface of the pronotum, but more especially the metazone, is finely tuberculate. The wings are more than twice as long as wide. The posterior femora do not surpass the abdomen.

In color there seems to be a constant difference between the males and the females, the former being very obscurely maculate so that the appearance is nearly uniform dull brown, with the tegmina rather faintly flecked with somewhat evenly distributed small spots of fuscous and the posterior femora plainly banded upon the upper surface. The female has the head and face, disk of the pronotum, and the posterior femora with the body-color light yellow or reddish brown, maculate everywhere, except on the posterior femora, more or less distinctly with numerous thickly scattered small brown or fuscous spots. The lateral lobes of the pronotum are, in the light colored females, generally much darkened upon the prozone. The tegmina are distinctly spotted with thickly scattered and evenly distributed quadrate fuscous spots. The posterior tibiæ are dull yellow.

Described from three males and two females which were collected by Mr. Coquillett (in whose honor the species is named), in Los Angeles county, California. These specimens now belong to the United States National Museum.

This species is of peculiar interest in possessing the most highly developed musical organ known in the family *Acrididae*. According



to Mr. Coquillett its stridulation is as loud and sustained as that of some of the *Cicada*.

XXV. **STENOBOTHRUS**, Fisch. Fig. 25.

“ Vertex triangular, obtuse,\* with the foveolæ, which are visible from above, narrow, oblong, rhomboidal. Antennæ filiform. Frontal costa convex. Pronotum with the disk almost plain, the median carina distinct and cut by the principal sulcus only, and the lateral carinae straight or more or less arcuate or sinuate. The lateral lobes are higher than long,† with the lower angles somewhat obtuse. Tegmina fully developed, rarely abortive, with the mediastine area more or less extended, either narrow throughout or widened at the base, and sometimes including an adventitious vein. The scapular area is filled with oblique transverse veins and in the male is dilated. The radial vein is composed of three principal branches; there is no intercalary vein. The ulnar vein is composed of two branches which sometimes unite again before the middle, the dividing vein is straight, and the plicate vein is free or united with the dividing. The wings are fully developed or rarely abortive, not fenestrated, rarely wanting. The posterior femora are frequently mottled, very rarely distinctly spotted. The posterior tibiæ are frequently dull testaceous, rarely red. The sternum is rather broad, with the mesosternal lobes widely separated and the metasternal lobes distant. The first abdominal segment is furnished with a closed tympanum. The anal segment is longitudinally sulcate with the supra-anal plate of the male obtusely triangular. The subgenital plate of the male is recurved with the apex obtuse or acuminate. The valves of the ovipositor are short but exerted, and sometimes furnished with a lateral basal tooth.”

*Stenobothrus*, Fisch., 1843. Orth. Europ., 313.

*Stenobothrus*, Bruner, 1882. Pro. Europ. Orth., 100.

*Stenobothrus*, Bruner, 1893. Rev. Sys. Orth., 122.

*Stenobothrus*, Morse, 1896. Psyche, VII, 327, fig. 12.

In part, *Gomphocerus*, Stål, 1873. Recen. Orth., 193.

*Gomphocerus*, Bolivar, 1876. Orth. de Esp., 107.

*Chorthippus*, Fieb.

This large European genus is very meagerly represented in this country by only four species, though formerly it served the same use-

\* In *St. curtipennis*, Harr., the vertex of the male is acute.

† In *St. curtipennis*, Harr., the lateral lobes of the pronotum are about equally high and long.

ful purpose in *Truxalinea* that *Ædipoda* did in *Ædipodinae*, and was employed as a convenient appellation for species that did not fall in any other genus.

KEY TO STENOBOTHRUS, Fisch.

- A.<sup>1</sup> Tegmina unspotted. Posterior tibiæ never red.  
 B.<sup>1</sup> Median carina of the vertex obsolete. Lateral carinæ of the pronotum divergent from the first sulcus. Posterior margin of the metazone angulate. Disk much broader at the posterior than at the anterior margin. . . . . 1.—*Curtipennis*, Harr.  
 B.<sup>2</sup> Median carina of the vertex slight but distinct. Lateral carinæ of the pronotum divergent from the second sulcus. Posterior margin of the metazone rounded. Disk not much broader at the posterior than at the anterior margin. . . . . 2.—*Coloradensis*, n. sp.  
 A.<sup>2</sup> Tegmina spotted more or less distinctly. Posterior tibiæ red.  
 B.<sup>1</sup> Lateral lobes of the pronotum not much narrower at the lower margin than at the lateral carinæ. Median carina of the pronotum cut a little in front of the middle. Tegmina about as long as (female) or longer than (male) the abdomen, distinctly spotted. . . . . 3.—*Brunneus*, Thos.  
 B.<sup>2</sup> Lateral lobes of the pronotum much narrower at the lower margin than at the lateral carinæ. Median carina of the pronotum cut a little behind the middle. Tegmina about half (male) or less than half (female) the length of the abdomen. . . . . 4.—*Sordidus*, n. sp.

1. STENOBOTHRUS CURTIPENNIS, Harr.

*Locusta curtipennis*, Harr., 1835. Cat. Ins. Mass., 56.

*Locusta (Chloëaltis) curtipennis*, Harr., 1862. Treat. Ins. Inj. Veg., 184, pl. iii, fig. 1.

*Locusta (Chloëaltis) curtipennis*, Rathvon, 1862. Rept. Com. Agr., 368, fig. 28.

*Stenobothrus curtipennis*, Scud., 1862. Jour. Bost. Soc. Nat. Hist., VII, 456.

*Stenobothrus curtipennis*, Scud., 1862. Can. Nat., VII, 286.

*Stenobothrus curtipennis*, S. I. Smith, 1868. Proc. Port. Soc. Nat. Hist., I, 148.

*Stenobothrus curtipennis*, Walk., 1870. Cat. Derm. Salt., IV, 754.

*Stenobothrus curtipennis*, S. I. Smith, 1872. Rept. Sec. Agr. Conn., 376.

In part, *Stenobothrus curtipennis*, Thos., 1873. Syn. Acrid. N. Am., 91.

*Stenobothrus curtipennis*, Scud., 1874. Fin. Rept. Geol. Surv. N. H., I, 373, fig. 37.

*Stenobothrus curtipennis*, Thos., 1876. Bul. I, Ill. State Lab. Nat. Hist., 61.

*Stenobothrus curtipennis*, Provancher, 1877. Faune Ent. du Can., 43.

*Stenobothrus curtipennis*, Lintner, 1885. 2nd Rept. Ins. N. Y., 196.

*Stenobothrus curtipennis*, Fernald, 1887. Orth. N. E., 37.

*Stenobothrus curtipennis*, Davis, 1889. Am. Ent., V, 81.

*Stenobothrus curtipennis*, McNeill, 1891. Psyche, VI, 65.

*Stenobothrus curtipennis*, J. B. Smith, 1892. Bul. 90, N. J. Agr. Exp. Sta., 31.

*Stenobothrus curtipennis*, Osborn, 1892. Proc. Iowa Acad. Sci. 1890-1891, 4.

*Stenobothrus curtipennis*. Scud., 1893. 23rd Ann. Rept. Ent. Soc. Ont., 76, fig. 52.

*Stenobothrus curtipennis*, Morse, 1894. Psyche, VII, 14 and 104.

*Stenobothrus curtipennis*, Blatchley, 1894. Can. Ent., XXVI, 222.

*Stenobothrus curtipennis*, Blatchley, 1896. Can. Ent., VII, 327, fig. 12.

*Stenobothrus longipennis*, Scud., 1862. Jour. Bost. Soc. Nat. Hist., VII, 456.

*Stenobothrus longipennis*, S. I. Smith, 1868. Proc. Port. Soc. Nat. Hist., I, 148.

*Stenobothrus longipennis*, Walk., 1870. Cat. Derm. Salt., 754.

*Stenobothrus longipennis*, Thos., 1873. Syn. Acrid. N. Am., 91.

*Stenobothrus longipennis*, Thos., 1875. Rept. Geol. and Geog. Surv. W. 100 Mer., V, Zool., 872.

*Stenobothrus longipennis*, Thos., 1876. Bul. I, Ill. State Lab. Nat. Hist., 61.

*Stenobothrus longipennis*, Provancher, 1877. Faune Ent. du Can., 43.

*Stenobothrus longipennis*, Morse, 1894. Psyche, VII, 14 and 104.

Not *Stenobothrus curtipennis*, Thos., 1872. Prelim. Rept. U. S. Geol. Surv. Mont., 430.

Not *Stenobothrus curtipennis*, Bruner, 1877. Can. Ent., IX, 144.

Not *Stenobothrus longipennis*, Scud., 1880. 2nd Rept. U. S. Ent. Com., App. II, 25.

Not *Stenobothrus curtipennis*. Bruner, 1885. Rept. Com. Agr., 307.

**Hab.** The North Atlantic and North Central States and Canada west to the Red River. The references to this species from the Northwest are, I think, mistaken, and should be made to the closely allied

species, *S. coloradensis*; n. sp. Mr. Bruner's thorough report on the Kansas *Orthoptera* does not give *S. curtipennis* as occurring in that State, so that Iowa seems to be the western limit of the eastern species and Nebraska (probably north-western) the eastern limit of the western species.

2. STENOBOTHRUS COLORADENSIS, n. sp. Figs. 25a, 25b.

*Stenobothrus curtipennis*, Thos., 1870. Prelim. Rept. U. S. Surv. Mont., 430.

*Stenobothrus curtipennis*, Bruner, 1877. Can. Ent., IX, 144.

*Stenobothrus curtipennis*, Scud., 1880. 2nd Rept. U. S. Ent. Com., App. II, 25.

*Stenobothrus curtipennis*, Bruner, 1885. Rept. Com. Agr., 307.

*Stenobothrus*, sp., Uhler, 1877. Bul. U. S. Geol. and Geog. Surv. Terr., III, 793.

Length (female).....	21	mm.
Tegmina.....	18	mm.
Antennæ.....	7	mm.
Femora.....	12.5	mm.

The vertex is narrow, about equal to the short diameter of the eye. The scutellum has a distinct arcuate sulcus divided by a very plain carina running close to its anterior margin. The walls of the scutellum consist of a distinct raised line which is curved rather than angulate. The lateral foveolæ are linear. The frontal costa is rounded, narrow, and punctate above the ocellus, with its sides sub-parallel; below it is shallowly sulcate with the sides somewhat rapidly divergent. The antennæ are filiform, flattened, and barely as long as the head and pronotum. The pronotum has the median carina very distinct, cut very slightly behind the middle by the principal sulcus. The first sulcus is about half-way between the anterior margin of the disk and the principal sulcus. The lateral carinæ are gently curved, being most nearly approximate about the first sulcus. The posterior margin is rather gently arcuate with the disk at that point very little wider than the anterior margin. The lateral lobes of the pronotum are a little higher than long. The tegmina are yellowish-brown, plain, and about half as long as the abdomen. The posterior femora and tibiæ are reddish-yellow and immaculate except for the black spots at the knee. The color is olivaceous brown deepening to a reddish brown on the abdomen, with the top of the head and the disk of the pronotum

lighter and a very much broken blackish stripe behind the eye. The surface is everywhere shining, but least so on the top of the head and pronotum.

Very closely related to *Stenobothrus curtippennis*, but sufficiently distinct to be easily recognized. When compared with that species, *coloradensis* has the vertex narrower between the eyes with the median carina distinct instead of very faint. The antennæ of the female are scarcely as long as the head and pronotum instead of being distinctly longer. The pronotum is much shorter proportionally and decidedly less expanded posteriorly, the disk being scarcely wider at the posterior margin than at the anterior margin instead of being  $1\frac{1}{2}$  times as wide. The lateral carinæ are gently instead of strongly curved, and the posterior margin of the disk is rounded instead of angulate. Finally, the posterior femora are more robust.

Described from a single female received from Prof. C. P. Gillette, Fort Collins, Colorado. The specimen was labeled "Colo. 1936."

**Hab.** The eastern slopes of the Rocky Mountains, south to Utah and Colorado, and west to the Sierra Nevada Mountains.

3. *STENOBOTHRUS BRUNNEUS*, Thos.

*Stenobothrus brunneus*, Thos., 1871. Prelim. Rept. U. S. Geol. Surv. Wyo., 266.

*Stenobothrus brunneus*, Thos., 1872. Prelim. Rept. U. S. Geol. Surv. Mont., 430.

*Stenobothrus brunneus*, Thos., 1873. Syn. Acrid. N. Am., 91.

*Stenobothrus brunneus*, Bruner, 1877. Can. Ent., IX, 144.

*Stenobothrus brunneus*, Bruner, 1883. 3rd Rept. U. S. Ent. Com., 56.

This is apparently a somewhat uncommon species since it has been reported in but two or three collections. It is found from Nebraska to the Sierra Nevada Mountains and south to Colorado. The National Museum contains specimens labeled *Gomphocerus brunneus* from Fort McLeod, Henry county, Idaho; Henry Lake, Idaho, and Fort McKinney, Wyoming.

4. *STENOBOTHRUS SORDIDUS*, n. sp. Fig. 25c.

Length (male).....	17 mm.	(female).....	24 mm.
Antennæ.....	10 mm.	.....	10 mm.
Tegmina.....	7 mm.	.....	5.5 mm.
Post. Fem.....	10 mm.	.....	12 mm.

Most nearly related to *S. brunneus*, but it is easily distinguished

from that species in the short tegmina and the very different pronotum which has the median carina cut a little behind instead of a little in front of the middle, and the lateral lobes not higher than wide and much narrower below than at the lateral carinæ. This species also lacks the longitudinal median stripe generally present on the head and pronotum and tegmina of *S. brunneus*, and there is scarcely a trace of a median carina on the vertex.

Described from numerous specimens in the United States National Museum which are labeled *Gomphocerus shastanus*. Scudd.

**Hab.** Salmon City, Idaho.

XXVI. **BRUNNERIA**, n. gen. Fig. 26.

Vertex broad, the distance between the eyes being equal to the width of one of the tegmina at the base, very nearly horizontal, convex, not at all sulcate, with the boundary walls in front straight raised lines which meet in an angle a little greater than 90 degrees (male). The lateral foveolæ are deeply impressed, plainly visible from above, rhomboidal, four or more times as long as wide, and with heavy walls which are approximate at the tip of the vertex. The frontal costa viewed from the side is generally arcuate and moderately oblique. It is plain throughout or very slightly hollowed below the ocellus with a single row of distinct punctures on either side. It is rather abruptly acuminate at the apex, suddenly and considerably expanded opposite the antennæ, decidedly contracted again at the ocellus, and below rather rapidly expanding. The antennæ are slightly depressed, filiform, and considerably longer than the head and pronotum combined. The pronotum has the disk very gently rounded from side to side, a little longer than the top of the head. The anterior margin of the disk is very slightly angulate, the posterior margin is straight or very slightly angulate. The median carina is a moderately heavy raised line, equally distinct throughout, cut once a little behind the middle by the principal sulcus. The lateral carinæ are slight, moderately sinuate, and cut by the principal sulcus only. The lateral lobes are about as high as long, with the anterior margin nearly perpendicular and the posterior margin considerably inclined and the posterior lower angle angulate. The tegmina are abortive and the posterior femora slender.

This genus is closely related to *Stenobothrus*, but is distinguishable in having the posterior margin of the pronotum straight, the lateral lobes not higher than broad, and the elytra abortive.

1. BRUNNERIA SHASTANA, Scud. Figs. 26a, 26b.

This species is reported by Mr. Scudder as occurring on Mount Shasta among the firs. It has not been reported elsewhere. The United States National Museum contains a male and a female which seem to be typical specimens. I have examined a male from Mr. Scudder's collection.

*Gomphocerus shastanus*, Scud., 1880. 2nd Rept. U. S. Ent. Com., App. II, 25, pl. xvii; fig. 15 (male), 18 (female).

XXVII. GOMPHOCERUS, Thunb. Fig. 27.

Similar to *Stenobothrus* except that the antennæ are furnished with a short depressed club at the apex, and (according to Brunner) the tympanum is partially open.

*Gomphocerus*, Thunb., 1815. Mem. Ac. Petersb., V, 221.

*Gomphocerus*, Serv., 1839. Hist. Nat., 745.

In part, *Gomphocerus*, Stål, 1873. Recen. Orth., 93.

In part, *Gomphocerus*, Bol., 1876. Syn. Orth. Esp., 100 and 107.

*Gomphocerus*, Brunner, 1882. Pro. Eur. Orth., 128.

*Gryllus*, *Acridium*, Brunner.

KEY TO GOMPHOCERUS, Thunb.

- A.<sup>1</sup> Size small (male about 14 mm.), anterior tibiæ clavate with a distinct groove on the outer face. . . . . 1.—*Clavatus*, Thos.
- A.<sup>2</sup> Size medium (male about 18 mm.), anterior tibiæ only very moderately and regularly expanded apically in the male. . . . .  
 . . . . . 2.—*Clepsydra*, Scud.

1. GOMPHOCERUS CLAVATUS, Thos.

*Gomphocerus clavatus*, Thos., 1873. Syn. Acrid. N. Am., 96.

*Gomphocerus clavatus*, Bruner, 1877. Can. Ent., IX, 144.

*Gomphocerus clavatus*, Bruner, 1883. 3rd Rept. U. S. Ent. Com., 56.

*Gomphocerus carpenterii*, Thos., 1874. Bul. 2, U. S. Geol. and Geog. Surv. Terr.

*Gomphocerus carpenterii*, Thos., 1875. Rept. Geol. and Geog. Surv. W. 100 Mer., V, Zool., 871.

*Stenobothrus carpenterii*, Thos., 1876. Proc. Dav. Acad. Nat. Sci., I, 251.

I have united these species after much hesitation. The United States National Museum contains Thomas' types of both *clavatus* and

*carpenterii*, in each case a single male. These apparently differ only in that the tibiæ of the latter are much more decidedly clavate. But this, as well as the gibbosity of the pronotum of the male and the size of the club of the antennæ, is a variable character, as I have ascertained from the examination of many specimens.

**Hab.** The great plains east of the Rocky Mountains, from Dakota to New Mexico, and eastward to Western Kansas and Nebraska.

2. GOMPHOCERUS CLEPSYDRA, Scud. Figs. 27a, 27b.

*Gomphocerus clepsydra*, Scud., 1876. U. S. Geol. Surv. W. 100 Mer, App. II, 506.

*Gomphocerus clepsydra*, Bruner. 3rd Rept. U. S. Ent. Com., 56.

*Gomphocerus clepsydra*, Bruner. Rept. Com. Agr., 1885.

This species is, not improbably, a form of the preceding very variable species, but I have not sufficient material in this species to settle the point to my satisfaction. The United States National Museum contains one of Scudder's types (a male from New Mexico). In the same collection there is also a type of Scudder's *Gomphocerus antennaria*, which is identical with the species just described. I have not included *G. antennaria* in the synonymy of *G. clepsydra* as I do not know where it was described, if it has been described at all. My recollection is that Dr. Scudder has at some time informed me that no description of it was ever published.

**Hab.** The great plains east of the Rocky Mountains, from British America to Northern New Mexico, and as far east as Kansas and Nebraska. The species is said by Bruner to be common in the Yellowstone Valley.

XXVIII. PNIGODES, n. gen. Fig. 28.

Head disproportionally large for the pronotum, it as well as the rest of the body being decidedly wider than the latter at its posterior margin. It exceeds the pronotum in length by about the length of the vertex in front of the eye. The scutellum of the vertex is nearly horizontal, deeply excavate and bounded anteriorly with distinct straight walls which meet at an angle of 90 degrees (female) or less (male).

The frontal costa is regularly acuminate and sulcate above to the tip of the vertex, regularly divergent (male) or slightly and abruptly expanded below the ocellus (female). The lateral foveolæ, plainly visible from above, are sub-rhomboidal, very slightly narrowed anteriorly.



They are twice as long as wide with a heavy boundary wall. The antennæ are filiform, little (female) or somewhat (male) exceeding the combined length of the head and pronotum.

The pronotum have the anterior and posterior margins of the disk slightly and about equally rounded. The median carina is a moderately high raised line equally distinct throughout and cut by the principal sulcus only, decidedly behind the middle. The lateral carinæ are very slight and are clearly outlined with white. They are cut by all three sulci. The lateral lobes have the posterior margin nearly vertical, the anterior moderately inclined, and the posterior lower angle broadly rounded. The valves of the ovipositor of the female are included.

The posterior femora are strong and marked above as in *Psoloëssa* with three triangular dark-brown spots. The posterior tibiæ have the apical spur on the inner side about twice as long as the one beside it.

1. PNIGODES MEGOCEPHALA, n. sp. Figs. 28a, 28b.

Length (male).....	15	mm.	(female).....	19	mm.
Tegmina.....	4.5-5.5	mm.	.....	7	mm.
Antennæ.....	6	mm.	.....	6.5	mm.
Post. Fem.....	9	mm.	.....	10.5	mm.

Yellowish-brown varying to dark-brown without distinct marks except the three triangular spots on the upper face of the posterior femora and the light-colored lateral carinæ of the pronotum bordered below with black and within on the disk of the metazone by a black triangular spot. In some specimens, however, the top of the head, the disk of the pronotum, and the anal field of the tegmina are light yellowish-brown and the black stripe of the pronotum is expanded backward across the lateral field of the tegmina. The latter have the longitudinal veins unusually prominent and, except in the variety just described, they are faintly flecked with numerous small spots of darker than the ground color. The posterior tibiæ are reddish.

This species seems to be confined to the Pacific Coast. The United States National Museum contains numerous specimens from Yuba county and Butte county, California.

XXIX. EREMNUM, n. gen. Fig. 29.

Vertex somewhat declivent, broader than the frontal costa at the clypeus, sulcate, without a median carina, bounded by straight, sharp

but slight carinæ which meet at the front at an angle greater or less than a right angle. The lateral foveolæ are sub-quadrated, about twice as long as broad, very distinct and very apparent from above. The frontal costa is about half as wide at the vertex as at the clypeus, slightly sulcate with low broad carinæ along the sides. Seen from the side the face is moderately arcuate and moderately oblique. The antennæ are filiform, a little (female) or considerably (male) longer than the head and pronotum. The median carina of the pronotum is quite distinct and cut once behind the middle by the principal sulcus. The lateral carinæ are very strongly sinuate and the posterior margin of the metazone is roundly and very obtusely angulate. The lateral lobes of the pronotum are higher than long with the anterior and the posterior margins nearly straight and vertical. The mesosternal lobes are separated by a space several times as wide as long in both sexes. The metasternal lobes are separated by a space a little longer than wide in male and female. The tegmina and wings are well developed, not quite equaling or somewhat longer than the abdomen. The former have the scapular area transparent and filled with a single series of oblique cross-veins. The discoidal and ulnar areas have each a false vein with a single row of cells on either side. The posterior femora have three usually well marked sub-triangular or irregular brown spots on the upper face. The posterior tibiæ are red or yellowish with the spurs on the inner side much elongated and very unequal. The ovipositor is very slightly exerted, only the extreme tip being visible.

This genus is North American and so far as known is represented by two species which are apparently confined to the northern and western states. All the species seem to be partial to sandy and rather barren soil.

#### KEY TO EREMNUM, n. gen.

- A.<sup>1</sup> Tegmina very obscurely spotted or quite plain. 1.—*Deorum*, Scud.  
 A.<sup>2</sup> Tegmina usually distinctly and thickly spotted, never plain . . . . .  
 . . . . . 2.—*Scudderi*, Bruner.

#### 1. EREMNUM DEORUM, Scud. Figs. 29a, 29b.

*Chrysochraon deorum*, Scud., 1876. Bul. II, U. S. Geol. Surv. in Col., etc., 263.

*Chrysochraon deorum*. Bruner, 1883. 3rd Rept. U. S. Ent. Com., 55.

**Hab.** Garden of the Gods, Colo. (Scudder). The National Museum contains several specimens, one of them immature, which were

collected in the same locality. It does not seem to have been reported elsewhere unless it proves to be identical with the following species which is, I think, very probable. I have, however, too few specimens of this species to determine the matter positively.

2. EREMNUM SCUDDERI, Bruner.

*Aulocara scudderi*, Bruner, 1889. Proc. U. S. Nat. Mus., XII, 63.

*Aulocara scudderi*, Townsend, 1893. Ins. Life, VI, 30.

*Aulocara scudderi*, Blatchley, 1894. Can. Ent., XXVI, 217.

*Philobostroma parva*, McNeill, 1891. Psyche, VI, 64.

As noted above, this species is likely to prove a synonym of *E. decorum*. One variety of this species has the vertex usually broad between the eyes with the anterior margins bounded by carinæ which meet at an angle much greater than a right angle even in the male. Ordinarily a structural difference of this character would indicate specific distinctness, but as this species seems to exhibit considerable variations in this respect, I think it not advisable to name it. I have received this variety from Prof. G. P. Gillette under the name of *Aulocara scudderi*, Bruner, and the form with the narrower vertex under the name *Dociostaurus coloradensis*. Both forms being named by comparison with specimens determined by Mr. Bruner.

**Hab.** Montana to Illinois, extending northward into British America and southward to New Mexico. It is said by Mr. Bruner to be a very common species west of the Mississippi. It is probably very rare eastward. I have found it in a few localities near Moline, Ill., where it seems to be confined to a few sandy hilltops along the Mississippi river.

XXX. STIRAPLEURA, Scud. Figs. 30a, 30b, 30c.

Vertex narrow, not exceeding half the short diameter of the eye, horizontal or slightly declivent, deeply sulcate with high lateral walls which meet at an acute angle in front and form a sub ellipse or a sub-hexagon open behind where there is always some trace of a median carina. The lateral foveolæ are rhomboidal once or twice as long as broad. The frontal costa is acuminate above, regularly divergent downward and sulcate throughout. Viewed from the side, the face is slightly convex and nearly perpendicular or moderately oblique. The antennæ are filiform short, scarcely exceeding the head and pronotum in length

even in the male. The disk of the pronotum is flat with all the carinæ distinct, the median being cut by the principal sulcus only in front of the middle. The lateral carinæ are very strongly sinuate in front of the middle. The posterior margin of the metazone is strongly angulate. The lateral lobes of the pronotum are higher than wide with the anterior and posterior margins nearly straight and vertical. A single or double series of somewhat irregular and broken carinæ extends more or less distinctly from the middle of the anterior border to or toward the upper posterior angle. The carinæ occupy the middle of a light stripe which is usually distinct and never entirely wanting. A usually more distinct but low broad carinæ extends from about the middle of the lateral lobes toward the lower posterior angle. This is also outlined by generally lighter and strongly contrasting color. The episternum of the mesosternum has a distinct high carina which extends from the hind coxæ toward the base of the tegmina. The mesosternal lobes are separated by a space much broader than long in both sexes and the metasternal lobes by a space as long as (female) or longer than (male) broad. The tegmina and wings are well developed, equaling or exceeding considerably the abdomen. The former have the scapular field transparent, and filled by a single series of oblique cross-veins. The discoidal area has a somewhat prominent intercalary vein and the ulnar area a weak longitudinal vein. The posterior femora have three distinct triangular brown spots on the upper surface. The posterior tibiæ are red or yellowish with the apical spurs on the inner side more or less unequal in length. The ovipositor is barely or moderately exerted.

*Stirapleura*, Scud., 1876. U. S. Geol. Surv. W. 100 Mer., App. JJ, 510.

In part, *Psoloëssa*, Scud., 1875. Cent. Orth., 25.

This genus is North American and Western, none of the five species known being found east of the Mississippi River.

#### KEY TO STIRAPLEURA, Scud.

- A.<sup>1</sup> Posterior tibiæ with the spurs on the inner side not very unequal.  
 ..... 1.— *Ornata*, Scud.
- A.<sup>2</sup> Posterior tibiæ with spurs on the inner side very unequal, the apical one being at least one and one-half times as long as the one behind it.
- B.<sup>1</sup> General color brownish or yellowish, varied with darker brown and black spots and stripes.

- C.<sup>1</sup> Lateral foveolæ about twice as long as broad.
- D.<sup>1</sup> Face but little oblique (male) or vertical (female). Scutellum of the vertex pentagonal with the posterior side of the pentagon missing. Median carina not distinct upon the summit of the head. Tegmina (female) scarcely exceeding the abdomen. . . . . 2.—*Decussata*, Scud.
- D.<sup>2</sup> Face even in the female strongly oblique. Scutellum of the vertex elliptical with the posterior side of the ellipse open. Median carina distinct upon the summit of the head and accompanied by two supplementary carinæ. Tegmina far surpassing the abdomen in both sexes. . . . . 3.—*Texana*, Scud.
- C.<sup>2</sup> Lateral foveolæ scarcely longer than broad. . . . . 4.—*Delicatula*, Scud.
- B.<sup>2</sup> General color creamy white with a greenish tinge. Antennal sulci black. . . . . 5.—*Eurotiæ*, Bruner.

I. STIRAPLEURA ORNATA, Scud.

*Doclostaurus ornatus*, Scud., 1876. U. S. Geol. Surv. W. 100 Mer., App. JJ, 507.

*Doclostaurus ornatus*, Bruner, 1883. 3rd Rept. U. S. Ent. Com., 58.

**Hab.** Northern New Mexico (Scudder).

This species has been reported but once. I have examined the type which is in Mr. Scudder's collection. The species to which it belongs undoubtedly belongs to this genus and it is distinct as shown by the sub equal inner apical spurs of the hind tibiæ, by the thick and somewhat clavate antennæ and by the structure of the vertex.

2. STIRAPLEURA DECUSSATA, Scud. Figs. 30a, 30b.

*Stirapleura decussata*, Scud., 1876. U. S. Geol. Surv. W. 100 Mer., App. JJ, 510.

*Stirapleura decussata*, Scud., 1880. 2nd Rept. U. S. Ent. Com., App. II, 26.

*Stirapleura decussata*, Bruner, 1883. 3rd Rept. U. S. Ent. Com., 57.

*Psoloëssa coloradensis*, Thos., 1876. Proc. Dav. Acad. Nat. Sci., I, 252, pl. xxxvi, fig. 34.

**Hab.** Colorado (Scudder, Thomas); Colorado, Wyoming, New Mexico, Arizona, Montana (U. S. Nat. Mus.).

I have not seen the type of *S. decussata*, but it undoubtedly belongs to the genus which I have called *Stirapleura* and it agrees well in size and other particulars with *S. coloradensis*. It is very possible that

Thomas' name has priority as it was published in June. I have preferred Scudder's name, however, because it was the type of the genus.

3. STIRAPLEURA TEXANA, Scud. Fig. 30c.

*Psoloëssa texana*, Scud., 1875. Cent. Orth., 24.

*Psoloëssa texana*, Bruner, 1883. 3rd Rept. U. S. Ent. Com., 56.

*Pso'oëssa texana*, Coquillett, 1886. Rept. Com. Agr., 1885, 11.

*Psoloëssa texana*, Riley, 1893. N. Am. Fauna, 7, II, 252.

**Hab.** Texas (Scudder); San Joaquin Valley, California (Coquillett); Coso Valley, Southern California (Riley).

The United States National Museum contains several specimens from San Antonio, Texas, which I have referred to this species.

4. STIRAPLEURA DELICATULA, Scud.

*Scyllina delicatula*, Scud., 1876. Bul. II, U. S. Geol. and Geog. Surv. in Col., etc., 1875, 263.

*Scyllina delicatula*, Bruner, 1883. 3rd Rept. U. S. Ent. Com., 58.

*Scyllina delicatula*, Riley, 1893. N. Am. Fauna, No. 7, pl. 2, 252.

**Hab.** Garden of the Gods, Colorado (Scudder); Southern California (Riley).

I have examined one of Scudder's type specimens and it seems to be distinct as shown by its short lateral foveolæ. It is, however, very closely related to *S. decussata*.

5. STIRAPLEURA EUROTIÆ, Bruner.

*Psoloëssa* (?) *eurotiæ*, Bruner, 1889. Proc. U. S. Nat. Mus., XII, 62.

**Hab.** Laramie River (Bruner).

This species is said by Bruner to feed solely upon *Eurotia lanata* or sweet sage or winter-fat as it is variously known.

XXXI. PSOLOËSSA, Scud. Figs. 31a, 31b.

Vertex very slightly declivent, narrow, being less than half the short diameter of the eye and scarcely equal to the width of the frontal costa at the clypeus. It is deeply sulcate with high carinæ which are parallel throughout the greater part of their extent and which meet in front at an acute angle and are somewhat incurved posteriorly where they continue more or less distinctly along the summit of the head in

company with a median carina which scarcely extends forward farther than the posterior margin of the scutellum. The lateral foveolæ are deeply impressed, sub-triangular in shape, and less than twice as long as broad; the posterior is at right angles to the lower carina and the upper is the strongly arcuate hypothenuse. The frontal costa is scarcely sulcate, acuminate below and considerably divergent to the ocellus, beyond which it is parallel for some distance and finally again divergent to the clypeus. The face seen from the side is gently arcuate and considerably oblique. The antennæ are short, scarcely equaling the head and pronotum, sub-filiform, a little flattened, and very little expanded apically, and acuminate at the apex. The pronotum is similar to that of *Stirapleura* except that there are no carinæ on the lateral lobes. The episternal carina is present and the mesosternal and metasternal lobes have the same structure as in that genus. The tegmina exceed the abdomen in both sexes. The former are very slender and the discoidal area is destitute of the intercalary vein and is usually occupied by a single series of cross-veins. The posterior femora are robust and clearly marked with the triangular brown spots usual in this group of the sub-family. The posterior tibiæ are reddish or yellowish with the apical spurs on the inner side very unequal. The ovipositor is moderately exerted.

*Psoloëssa*, Scud., 1875. Ent. Notes, IV, 86.

This is a North American genus represented by three species which are all South-western.

#### KEY TO PSOLOËSSA, Scud.

- A.<sup>1</sup> Anterior half of the tegmina not infuscated by the extension of the postocular brown band. Triangular brown spots on the upper face of the posterior femora sharply defined and very distinct.
- B.<sup>1</sup> Tegmina thickly and rather evenly maculate everywhere except in the scapular area. Ash brown . . . . . 1.—*Maculipennis*, Scudder.
- B.<sup>2</sup> Tegmina plain, reddish-brown . . . . . 2.—*Ferruginæa*, Scudder.
- A.<sup>2</sup> Anterior half of the tegmina infuscated by the extension of the postocular brown band. Triangular brown spots on the upper face of the posterior femora less distinct . . . . . 3.—*Buddiana*, Bruner.

1. PSOLOËSSA MACULIPENNIS, Scud. Fig. 31.

*Psoloëssa maculipennis*, Scud., 1875. Ent. Notes, IV, 87.

*Psoloëssa maculipennis*, Bruner, 1883. 3rd. Rept. U. S. Ent. Com., 56.

*Psoloëssa maculipennis*, Townsend, 1893. Ins. Life, VI, 31.

**Hab.** Texas to Southern California.

2. PSOLOËSSA FERRUGINEA, Scud. Fig. 31a.

*Psoloëssa ferruginea*, Scud., 1875. Ent. Notes, IV, 87.

*Psoloëssa ferruginea*, Bruner, 1883. 3rd Rept. U. S. Ent. Com., 56.

**Hab.** Dallas, Texas, (Scudder), Arizona.

The United States National Museum contains specimens from the last mentioned locality.

3. PSOLOËSSA BUDDIANA, Bruner.

*Psoloëssa buddiana*, Bruner, 1889. Proc. U. S. Nat. Mus., XII, 61, pl. i, fig. 6.

**Hab.** Carrizo Springs, South-western Texas (Bruner).

The National Museum contains one of Bruner's types of this species.